PRIMARY HEALTH CARE

RECURRENT COST STUDY - BELIZE

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EXECUTIVE SUMMARY

At a time of weak economies and constraints in public budgets, it is increasingly necessary for decision-makers in public health to evaluate their budgetary expenditures with the objective of improving allocation toward effective priority activities and to increase efficiencies in the use of health funding.

This study of recurrent expenditures in public health in Belize was designed to provide information to decision-makers about the allocation and efficiency in the use of available national and donor resources. Using a methodology developed for comparative purposes and based on national budgetary and statistical data, the study estimated:

1. General budgetary allocations
2. Sources of revenue (national and donor)
3. Unit costs of selected primary health care interventions
4. Future resource requirements for reaching selected primary health care goals

The **major findings** of the study were:

1. Public health recurrent expenditures, after growing for four consecutive years, declined significantly in 1990/1, in real terms.

2. The proportion of the national budget allocated to hospitals has been growing steadily over the last five years, reaching 47% in 1990/1. This growth is particularly of concern since it precedes plans to construct a new major hospital in Belize City, which will place even greater demands on recurrent cost budgets.

3. At the same time, central administrative expenditures have declined to less than 10%, a figure that is probably too low to manage the whole national system effectively.

4. Unit costs of selected PHC services appear to be somewhat high relative to costs of similar services in other countries, although such comparisons should be viewed with caution. Comparisons of unit costs within the country suggest that unit costs of PHC services are much higher in Belize City district than they are in the rest of the country, suggesting that efforts to improve efficiency be initiated in that district.

5. Foreign sources of funding for primary health care are declining significantly in 1991/2. The MOH will need to replace an anticipated shortfall of US$ 400,000 in that fiscal year, if it is to keep the donor-funded activities going at the same levels.

6. In order to reach MOH targets for immunization, ARI and diarrhea control in the next five years. MOH will also need an additional BZ$ 300,000 annually devoted to these activities.

7. Unit costs of the Community Health Worker Program are extremely high (US$ 16.26 per family visit) suggesting the need to reduce administrative costs, increase the number of health workers, and increase the productivity of each health worker.

8. Allocations of personnel and distribution of PHC drugs are highly skewed toward Belize City district far out of proportion to the population of the district, suggesting inappropriate use of services in the district.

Recommendations and Conclusions

1. The decline in real public health expenditures, the need to allocate additional expenditures to PHC in order to reach MOH targets, and the need to replace donor funding in order to sustain PHC programs suggest that **a major effort needs to be made to find additional financing for public health activities**. This effort may involve seeking larger proportions of the national budget, but it is also likely to require major **new programs in cost-recovery and shifting some demand and costs to private providers**.

2. The health profile of Belize is moving into the **demographic transition toward a prevalence of chronic diseases, accidents and other life style problems like alcoholism.** The Ministry of Health should begin developing an approach to prevention of these adult health problems. It would be useful to consider the capability of the **Community Health Worker program to address these issues** as part of a program to increase the efficiency of their productivity.

3. Major administrative problems result both from the decline in resources available for central administration and from the inappropriate programming, management information and budgetary processes of both the Ministry of Health and the Ministry of Finance. Significant reforms are likely to require major study to **develop more efficient and rational administrative processes**.

4. The allocation analyses and the unit cost analysis suggest that resources are inappropriately concentrated in Belize City district and that they appear to be inefficient in implementing key PHC activities. **Operations research** projects should be developed to identify specific problem areas where **efficiencies can be achieved. Personnel efficiency studies** should be implemented to identify a more rational distribution of personnel across districts. The skewed nature of **pharmaceutical distribution** might be addressed through the current INVEC project activities of MSH.

5. The **unit costs of the CHW program are extremely high** and a variety of strategies should be adopted to lower those costs. These strategies include: 1) expanding the number of CHW; 2) reducing the supervision and administrative costs; 3) providing incentives to increase productivity of each CHW. In addition, as part of a broader reorientation toward prevention of chronic diseases, alcoholism, and accidents (the demographic transition policy), CHWs might be retrained to address these issues in their house to house visitations.

ACRONYMS

BZ$ 2.00 = US$ 1.00

ARI	Acute Respiratory Infection
BCG	Bacillus Calmette-Guerin Vaccine
BFLA	Belizian Family Life Association
BIB	Breast is Best
CHW	Community Health Worker
CMS	Central Medical Stores
DPT3	Diphtheria-Pertussis-Tetanus Vaccine
EEC	European Economic Community
EPI	Expanded Program in Immunization
GDP	Gross Domestic Product
GNP	Gross National Product
INVEC	Inventory Management Program for Pharmaceuticals
IPPF	International Planned Parenthood Federation
KAP	Knowledge, Attitude and Practice
MCH	Maternal and Child Health
MOF	Ministry of Finance
MOH	Ministry of Health
MSF	Medicos Sin Fronteras
MSH	Management Sciences for Health
NGO	Non-governmental Organization
ORS	Oral Rehydration Salts

ORT	Oral Rehydration Therapy
PAHO	Pan American Health Organization
PCI	Project Concern, International
PHC	Primary Health Care
TBA	Traditional Birth Attendant
UNDP	United Nations Development Programme
UNHCR	United Nations High Commission on Refugees
UNICEF	United Nations Childrens Fund
USAID	U.S. Agency for International Development
VSO	Voluntary Services Organization

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I. INTRODUCTION

LAC Health and Nutrition Sustainability Contract provides technical services support to the US Agency for International Development (A.I.D.) to assist the Latin America and Caribbean Bureau and USAID Missions engage in policy dialogue and to develop and evaluate more effective projects in health management, financing and nutrition.

One of the activities being undertaken as part of this contract is a study of recurrent costs of health care in a number of countries in Latin America and the Caribbean region. In response to interest expressed by the Belize Ministry of Health (MOH) and USAID Mission in this project, four consultants visited Belize to work with the MOH during two phases (July/August and October, 1991). The consultants were: Thomas Bossert, Project Director; Margaret Phillips, health economist; Veronica Vargas, health economist; and Annette Bongiovanni, nurse and health policy analyst.

This report presents the objectives of the study, the methods employed to implement it, the findings and the conclusions and recommendations reached. A brief background to Belize and its health system sets the scene for this study.

We would like to thank all the people who assisted us in this project and to acknowledge their interest and support. Among the Ministry officials who gave us access to and assistance in understanding budgets and service data we want especially to thank the Minister of Health, Dr. Theodore Aranda, and the Permanent Secretary, Dr. Fred Smith. The Directors of Primary Health Care and of Maternal and Child Health, Drs. Rao and Figueroa were particularly helpful and supportive, as were Nurse Benguche, Elaine Clark, Ernest Gledden, Debora Godoy. Officials from other donors and from PVO's were also extremely cooperative. The many other people who assisted us are listed in Annex G.

USAID officials were essential to the effectiveness of the study. Special thanks is due to Amelia Cadle, Health Programs Coordinator; Patrick McDuffie, GDO; and Barbara Sandoval, Representative.

II. BACKGROUND

A. General

Belize, a former British colony, has a small population of some 185,000 growing annually at an estimated 2.5%. Average population density is low (21 persons per square mile) and about 50% of the population is rural. Belize is a lower middle income country (GNP per capita of $US 1,720 in 1989)[1]. By some measures Belize is entering the demographic transition toward health indicators similar to those in more developed countries. For instance, respiratory, cardiovascular and cerebrovascular diseases are among the four leading causes of death. Infant mortality is quite low at 19 per 1000 live births and life expectancy is 68 years[2] Although these figures may be artificially low, due to under-counting of refugee population, they indicate significant difference with most of the countries of the Central American region.

The official capital is Belmopan, a newly created inland town, but Belize City, population 65,604, is where most business, including that of the government, is conducted. Apart from the Belize City Metropolitan area there are 6 other districts: Corozal and Orange Walk in the north, Stann Creek (or Dangriga) and Punta Gorda (or Toledo) in the south and San Ignacio and Belmopan (sometimes grouped together as Cayo district) in the center.

B. Government Health Services

The Ministry of Health has its headquarters in Belmopan where the Health Minister and his Permanent Secretary work, but is managed out of Belize City where the Director of Health Services and the 4 chief medical officers and other senior staff are based. Chart 1 presents a recent organogram of the MOH, though changes are still being made. One feature worth noting is the separation of responsibilities for MCH and PHC-community health worker programs. (See Chart 1)

Each district has a government hospital (staffed by doctors and professional nurses with 4 years training), an urban health center (managed by a public health nurse with 3 years of post secondary nursing, one year of midwifery and one year of public health training) and a number of rural centers (staffed by a rural health nurse with post primary and midwifery training). There are 28 health centers throughout Belize.

The urban health centers focus on maternal and child health and prevention activities, with the hospital outpatients performing most of the minor curative care. The rural health centers do both preventive and basic curative care and supervise some deliveries. Urban and rural health centers have weekly schedules and allocate each day to a different activity: pre-natal, post-natal, well baby (including weighing and vaccination) and outpatient (for rural centers), sessions are held on different days of the week. Mobile clinics are operated regularly from the urban and rural centers providing preventive and curative primary health care. Villages are

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[1] World Bank Development Report, 1991

[2] All figures in this paragraph are from BFLA Annual Report 1990-1991).

Ministry of Health

BELIZE

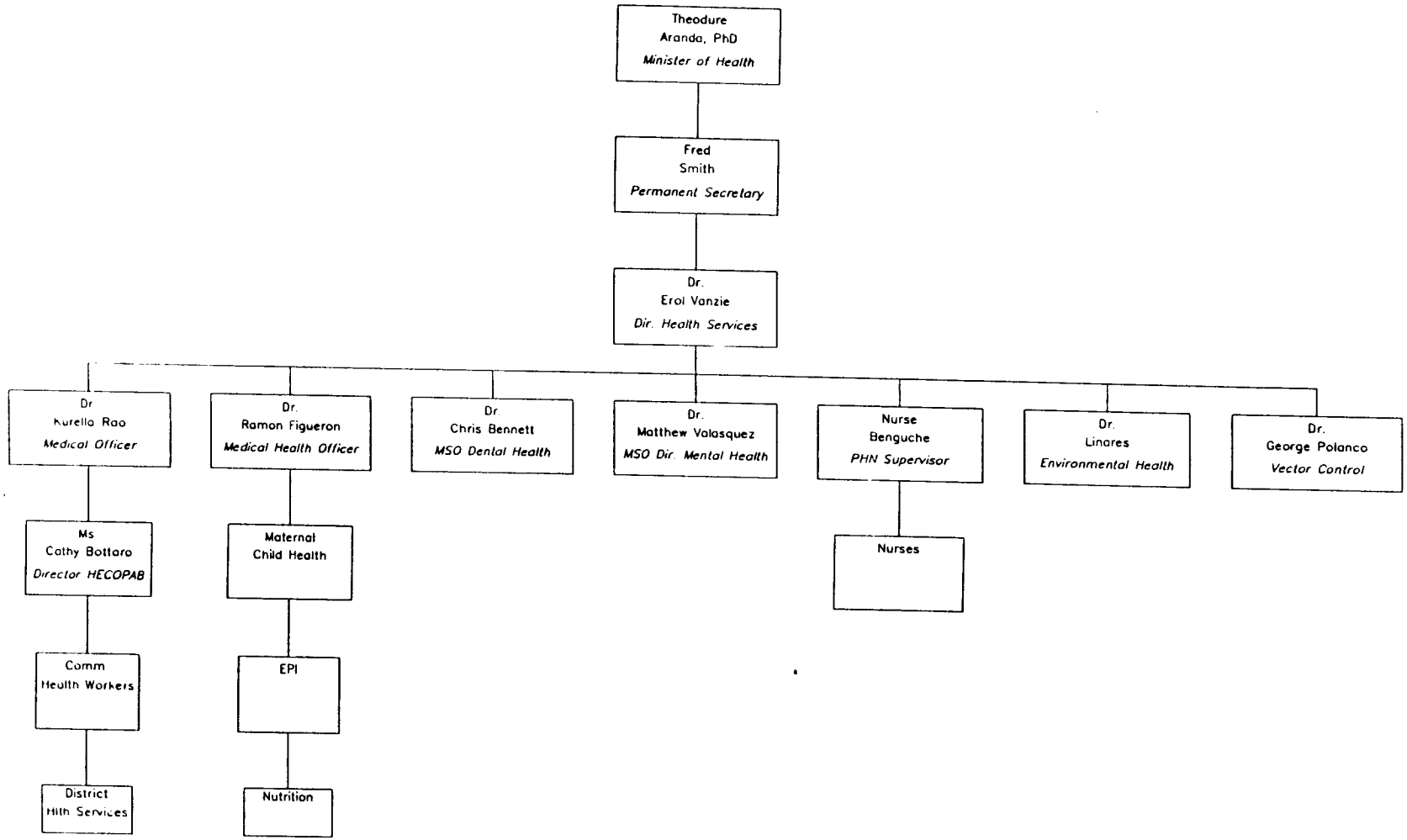

Chart 1

Most of the MOHs activities are funded centrally from general tax revenues. According to a recent study of cost recovery, only 2.4% of recurrent costs are recovered from fees collected inconsistently from hospitalized patients.[3] External donors (notably EEC/UNICEF, USAID, PAHO, the Government of Holland, Canadian Nurses Association, Rotary) provide material and financial support to the health sector through the MOH.

C. Other health providers

It is estimated that the private and public sectors account for about equal proportions of total health sector expenditures (Gwynne and Zschock, 1990).
Most of the country's health facilities, however, are run by the government. Social Security provides health benefits, but no health services. It contributes a small annual lump sum to the public health budget for medical care coverage of enrolles injured on the job.

The role of the private-for-profit sector is limited by restrictions placed on private practice: only specialists and general practitioners outside of Belize City are entitled to have a private practice and there currently is no private hospital in Belize (private practitioners use the government hospitals). Nevertheless, it is estimated that there are about as many doctors in private practice as in public service. Some agro-export interests (for example, the Banana Control Board and Belize Sugar industry) provide health services for workers and their families.[4]

There are several private nonprofit organizations directly involved in providing health care in Belize. The Belize Red Cross, the Belize Council for the visually impaired (providing training in primary eye care), the Mennonites who have their own rural health center, the US Peace Corps and the British Voluntary Service Overseas (VSO) supporting a couple of health personnel working with MOH and NGOs. Two NGOs offer services in the area of preventive health -- "Breast is Best" (BIB) and the Belize Family Life Association (BFLA).

BIB has trained volunteers throughout the whole country and supports 347 breast-feeding counselors. With an annual 1990 budget from AID of BZ$ 135,858 and additional support from UNICEF and PAHO (approximately BZS 12,000), BIB is currently seeking means of sustaining its program when AID funding stops in 1992. There were no service statistics available to determine unit costs of volunteer visits by the counselors. If the counselors visit as many families as the CARE Community Health Workers (27 family visits annually) discussed in Section V.E. below, the unit cost per visit would be BZ$ 15.78.

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[3]Charles Griffin and Gerard La Forgia, Health Financing and Management in Belize: An Assessment for Policy Makers. Volume II, Cost Recovery. 1991.

[4]For additional information on private sector health providers see: Gerard La Forgia, et al. Health Financing and Management in Belize: An Assessment for Policy Makers, Vol IV: The Private Medical Sector. 1991.

BFLA has assumed responsibility for family planning activities (in which the government is not officially involved) and devoted resources to lobbying the government, mounting advertising and training programs to inform the general public and health staff about family planning and operating a number of clinics throughout the country offering family planning advice and services.

With yearly expenditures of BZ$ 438,766 in 1990, the BFLA attended 5,209 contraceptive acceptor visits. Attributing all expenditures, including promotion and clinic services as well as administrative costs, to the cost of acceptor visits, BFLA is providing that service at a unit cost of BZ$ 84.23 per visit. This high unit cost is due to relatively low demand. As numbers of acceptor visits increases, it is likely that unit costs could be reduced considerably. No comparative figures were available From other providers.

There are other nonprofit organizations which, while not involved directly in the provision of health services, have played an important role in training and technical assistance, particularly for Community Health Workers. The government has invested very few resources in CHWs. Until this year, most of the financial responsibility rested with a variety of NGO's which trained and supervised CHWs throughout the country. CARE supports 98 active CHWs who work in the north of the country, MSF has 40 CHWs in the Cayo district where UNHCR also provided 20 CHWs, and in Toledo District 26 CHWs which were trained by Project Concern International are currently supported by MOH Division of Primary Health Care. All of these NGO's have completed or are about to complete their involvement with the CHW program and the government is planning to take over responsibility for training, supervision and on-going support for these CHWs.

III. OBJECTIVES

The principal task of the study was to document the level and distribution of recurrent costs incurred by the MOH and donors for health care services in Belize and, where feasible, to link these cost estimates with measures of output. Primary health care (PHC), and maternal and child health (MCH) activities in particular, was the main focus of the study.

The objectives of this exercise were three-fold:

- to reveal where health expenditures were going (to which types of inputs, which kinds of programs and which districts);
- to document the level of donor dependence in the health sector;
- to generate data (in the form of cost per unit output) for use in estimating future financing requirements and in highlighting possible inefficiencies in the distribution and use of resources.

The purpose was to provide an important tool for policy dialogue and project design and monitoring.

The exercise of gathering this data had another purpose also. Namely to explore and demonstrate the feasibility of generating adequate estimates of unit recurrent costs without the need for detailed facility level data collection, relying instead on centrally available statistics.

IV. METHODS

The consultants followed the general approach outlined in the document "Lineamientos metodologicos para determinar costos operativos" and the Scope of Work provided by LAC Health and Nutrition Sustainability[5]. At an early stage the purpose of the study was clarified with the MOH and the terms 'PHC', 'MCH' and 'Child Survival' defined. The core of the analysis focuses on a broad definition of Primary Health Care, including:

- all the activities at the rural and urban health centers including: all the activities of the MCH: well baby (including vaccination, weighing) pre-natal, post-natal, and health education programs;
- the CHW program;
- all the district level activities of the vector control, environmental sanitation, dental health;
- the community center, mobile activities of the mental health program[6]

These activities are implemented by several administrative units of the MOH, as seen in Chart 2.

Given the limited role of other organizations and the private sector in the provision of health services, most attention was paid to government services and some private non-profit programs, notably those for community health workers and family planning.

Key individuals in the headquarters of the MOH in Belmopan and Belize City were consulted to identify the nature, availability and location of financial and output statistics. As a result of these enquiries it was decided to collect financial data from 1986-1990 by broad program area and input type, and to do the detailed analysis of resources and outputs (for specific program areas and district) for the year 1990/91.

Data on recurrent costs and activities performed were collected using reports from previous studies, official health documents (national budgets, vote books by district and program) and interviews. Visits were made to the central administrative offices of key PHC programs and to the districts where the consultants met with the DMO, financial clerk, pharmacy dispenser, nurses from the urban health clinic in the district capital and the rural head nurse in several rural health centers.

Important donor agencies working in the health field (EEC/UNICEF, PAHO, USAID, CARE, MSF) were consulted for information on the investments made in health activities and the results achieved.

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[5]See Annex A

[6]It was not possible in the analysis to disaggregate the costs of the mental hospital from total expenditures in mental health, so the figures for this activity included hospital expenditures.

Primary Health Care Components

Ministry of Health

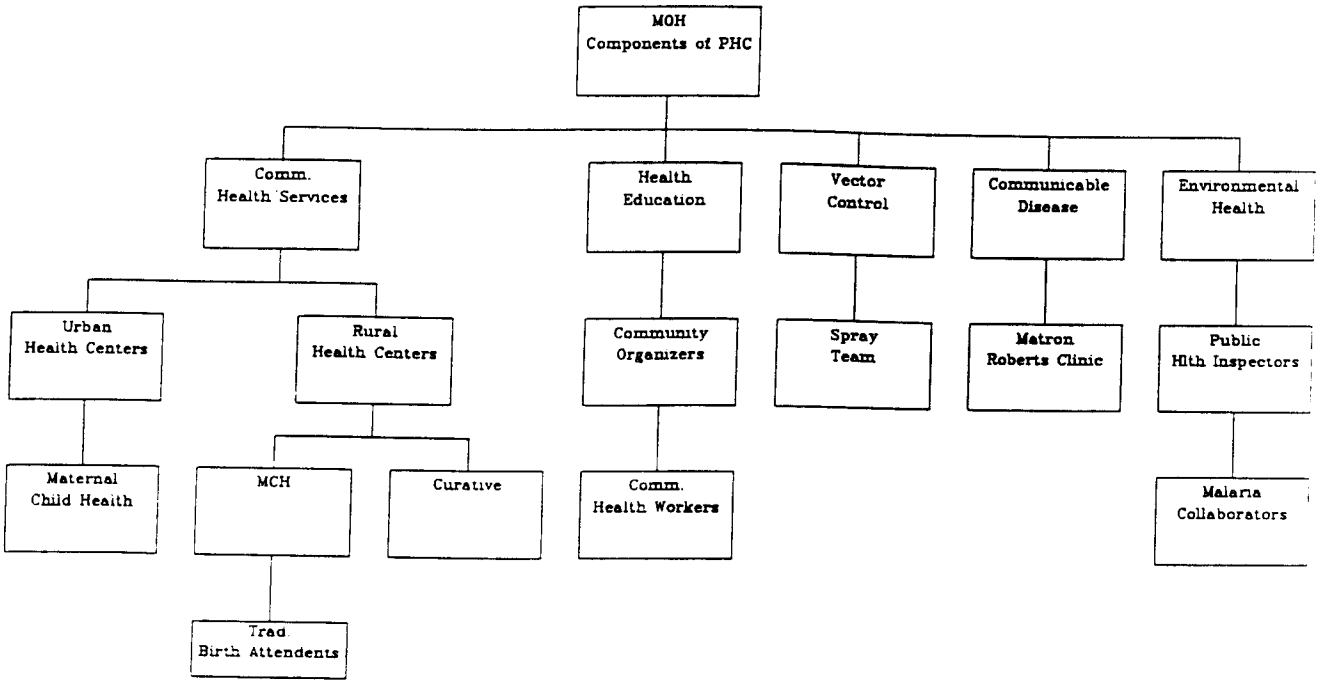

Chart 1

Except where noted, all annual figures refer to the Belize fiscal years which begin on April 1. Fc convenience, we will use the first year of a fiscal yeai as identifier (i.e. for FY 1986/7, which covers Apr 1986 to March 1987, we will use 1986 as identifier). All expenditure figures refer to actual expenditures, nc to budgetary authorizations. Also, except where noted, all dollar figures are for current Belize dollars (BZ 2.00 = US$ 1.00).

V. RESULTS

A. Allocation Issues

The Ministry of Health in context

Table 1 presents the relationship of MOH recurrent expenditures to the GNP.

In summary, the MOH had an annual recurrent budget of BZ$ 14,217,854 in FY 1990/91. This represents:

Per capita public health expenditure: BZ$ 76 in FY 1990/1

The MOH recurrent expenditures were 2% of the GNP in 1990/1

Public health recurrent expenditure as a percentage of central government recurrent expenditures were: 9.20% in FY 1989/90, representing a gradual decline from 11.73% in FY 1985/6.

Table 1

Belize: GNP and MOH Recurrent Budget, 1986-1990 Current BZ$

	1986	1987	1988	1989	1990
GNP (1)	404,600,000	492,200,000	562,800,000	636,400,000	724,400,000
MOH recurrent budget	10,165,000	12,372,696	13,219,281	14,176,801	14,217,854
MOH recurrent budget as % of GNP	2.51	2.49	2.35	2.23	1.96
MOH recurrent budget per capita	60	71	74	79	76
GNP recurrent budget per capita	2374	2832	3130	3536	389[illegible]

(1) IMF Roberto Rosales

These figures are relatively high compared with other countries in the Latin American region. A study by Gwynne and Zschock found that in 1985, of a selected number of LAC countries, only Jamaica had a higher percent of GDP devoted to public health expenditure (2.9%), while Guatemala expended only 0.7%.[7]

In constant per capita figures, the public health expenditures, after a period of almost continuous growth through FY 1989/90 have shown a recent decline. The FY 1990/91 per capita expenditures were lower than the FY 1981/88 figures. This decline in public expenditures in health is likely to force tradeoffs in service delivery and makes choices about funding allocation and revenue generation critically important. (See Table 2)

Financial Allocation of MOH Expenditures

Hospitals, Primary Health Care and Administration

Among the major categories of MOH expenditures several important trends are apparent. As Table 3 shows, public expenditures devoted to hospital care has increased over the last five years from 41% to 47% of the total MOH recurrent budget (See Annex F for actual figures). At the same time, expenditures for primary health care have remained relatively constant at around 20%. Expenditures for drugs were also relatively constant at around 20%, with the exception of FY 1989/90 when they peaked at 23.4%. The expenditures on Central Administration have been cut in half, declining from 17.2% to 8.6%. (See Table 3)

These trends suggest some emerging problems. Although the growth in hospital spending is not large, it comes at a time when the MOH is planning major new investments in a new Belize City Hospital, which will imply even greater additional recurrent expenditures in the hospital sector. This combination -- a steady growth in the allocation to hospitals and plans for even more demands for hospital spending -- is an explosive one for the recurrent cost budget of the MOH.

It appears that the growth in hospital spending has come at the expense of administration -- often not a poor trade-off when the administrative costs are high. However, administration is necessary for effective and efficient use of funds. Usually, an acceptable range of expenditures on administration is between 13-18%. There is a possibility that some administrative costs have been shifted to line items for hospitals and primary

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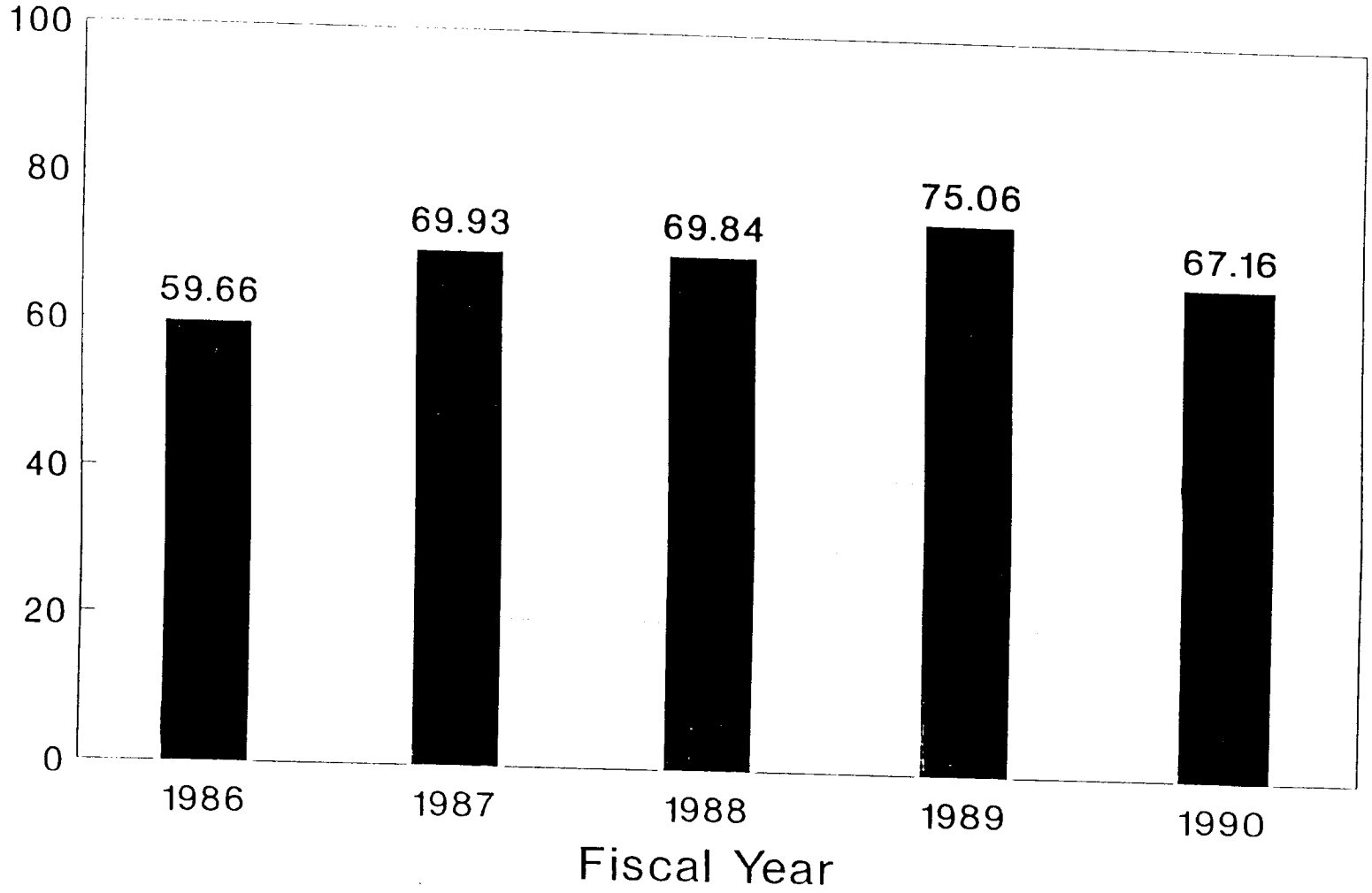
[7] Gretchen Gwynne and Dieter Zschock, "Health Care Financing in Latin America and the Caribbean," The Journal of Health Administration Education, vol 8, no. 4 (Fall 1990). It should be noted that we have compared percent of GNP figures for Belize with percent of GDP figures of the Gwynne and Zschock study. Since GNP tends to be larger than GDP, Belize is probably allocating a greater portion of its GDP to health.

Table 2

MOH Per Capita Expenditures FY 1986-19

in constant $BZ of 1986

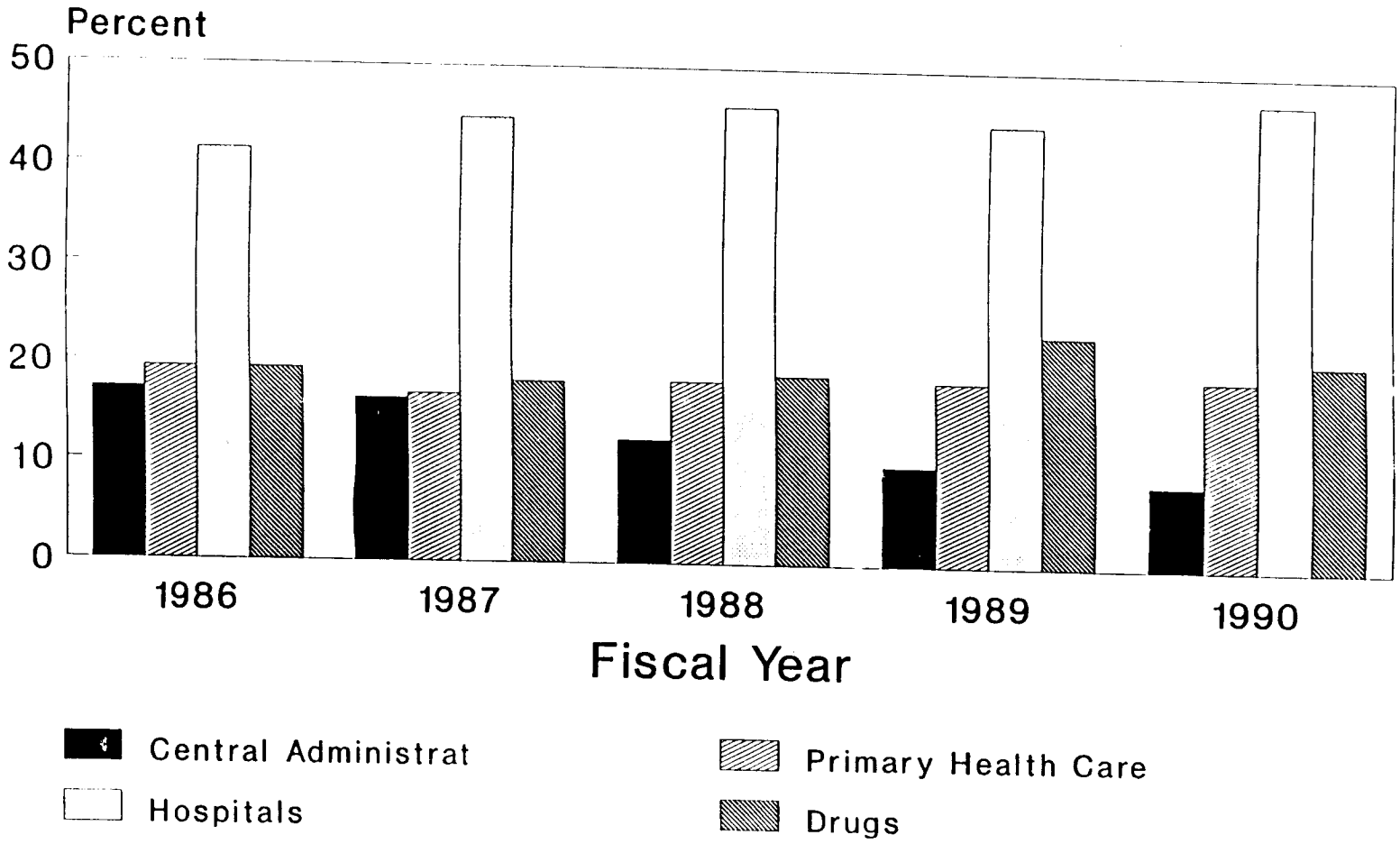


Source: Annex F

Table 3

MOH Recurrent Expenditures by Allocation

FY 1986-1987 to 1990-1991



Source: Annex F

care through a process of decentralization of administrative responsibility, however, there is no clear evidence of this shift and there are many examples of weak administration in the central offices. To cite only one example, the health information system is overloaded and without sufficient funds to expand.

The current trend suggests that cuts in administrative costs may have gone to the bone and that additional resources should be devoted to improving central administration. Planning and programming, H/MIS and financial accounting might be targets for additional administrative resources.

It is nevertheless, important to note that increased public spending on hospitals did not come at the expense of primary health care. Spending in this sector, as we noted, has remained constant at 20%. This figure is consistent with other countries in Central America.

Personnel, Drugs and Other

Other allocation trends are also problematical as is displayed in Table 4. Personnel expenditures are rising as a percent of overall spending, from 58.8% in 1986/7 to 66.1% in 1990/1. This trend is approaching the levels that are common to other countries in the Central American region and should be carefully watched.[5] Personnel budgets are relatively inflexible and are the most difficult to reduce in the future. Efforts to increase efficiency and to allow greater flexibility in program allocation are hampered by inability to control personnel expenditures. As personnel budgets grow, generally the other resources necessary for staff to provide quality care are reduced.

The budgetary categories that have lost support were utilities, equipment and other operating expenses. (See Table 4)

Allocations within Primary Health Care

The largest recipient of primary health care funding in 1990/91 was the vector control program (31% of the total PHC budget). While vector control costs are generally high in countries of the region, the funding devoted to this high cost program should be evaluated in relation to other priorities and expenditures. (See Chart 3)

Community Health Services, which supports most of the costs of the rural and urban health centers and their nursing staff, as well as the mobile clinics, received only 18% of the PHC budget. In contrast to the low central administrative funding for the Ministry as a whole, administrative costs (General Administration and Director of Health Services) within PHC absorbed 11%, probably an appropriate level.

It should be noted, however, that spending on health education is quite low, only 2%.

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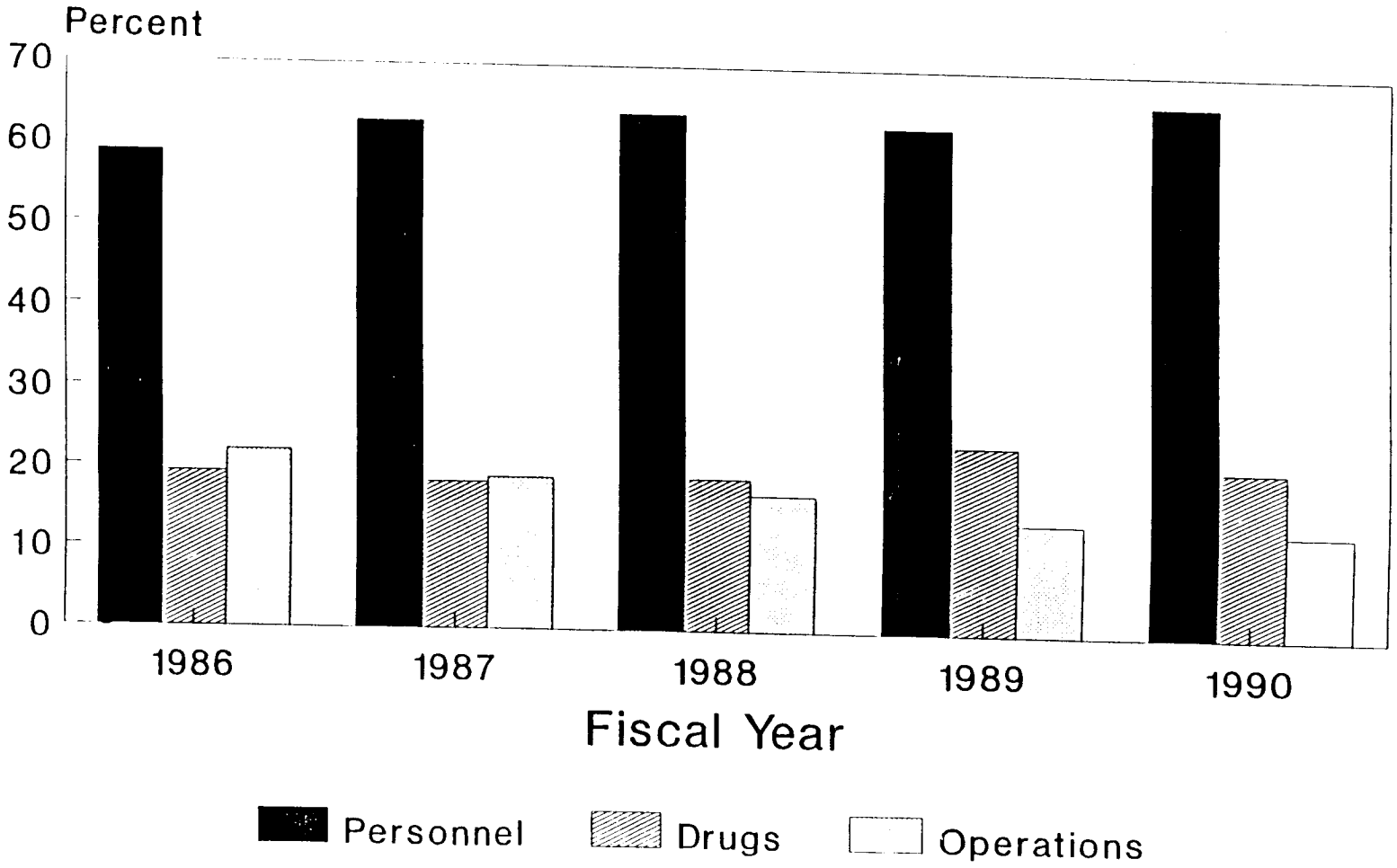
[5] In El Salvador personnel expenditures have reached over 70% of the MOH expenditures.

Table 4

MOH Recurrent Expenditures by Category
FY 1986 - 1991



PHC Recurrent Expenditure by Program
Total BZ$ 3,926,939, FY 1990-91
By Percent

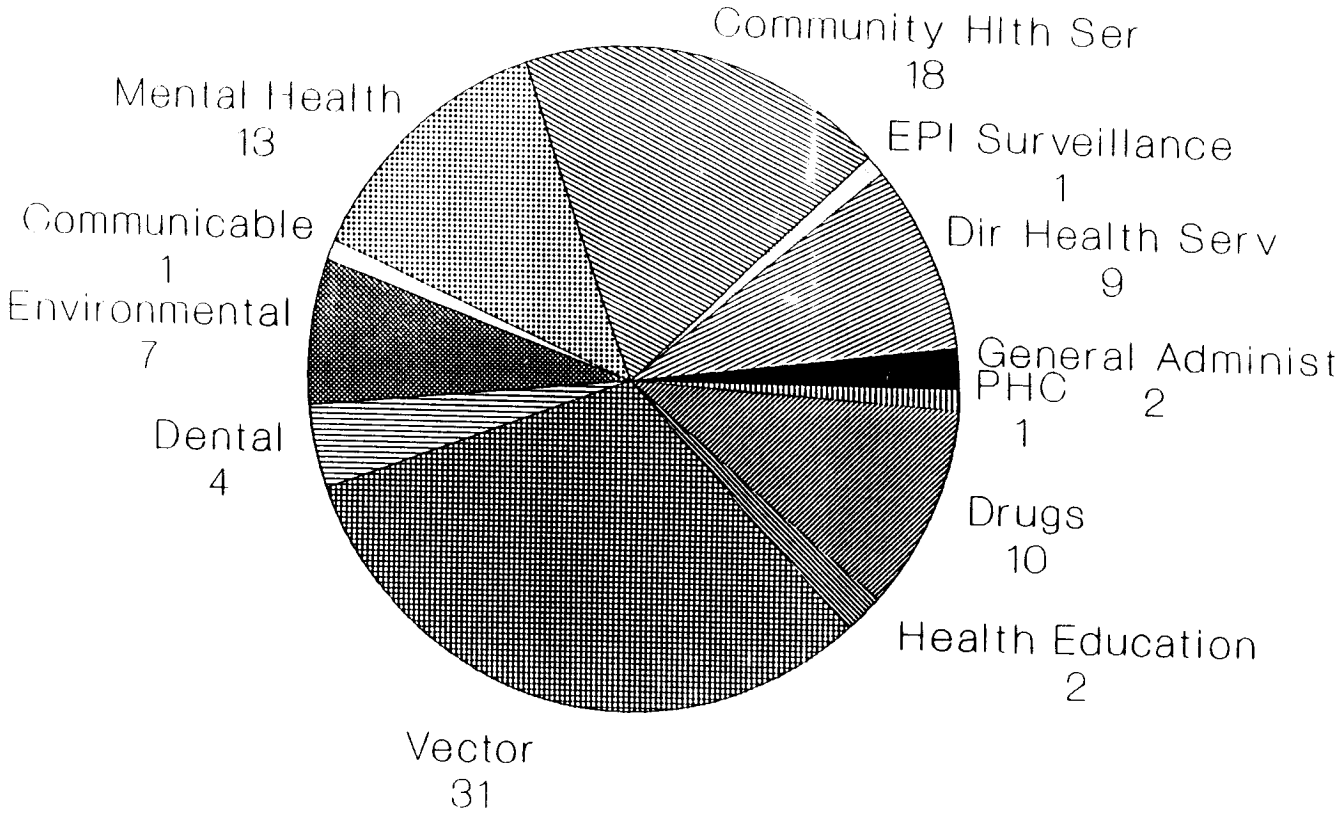


Chart 3
Source: Annex C

B. Sources of PHC Funding

All PHC public funding comes either from the national government budget or from external donors. There are no user fees collected in primary health care facilities. The user fees collected at hospitals provide very little under current practices -- Griffin and La Forgia (1991) estimate that 2.4% of the MOH operating budget was recouped in fees. Fees collected were less than the published fee schedules allowed. Contributing to hospital cost-recovery, the Social Security Board also pays a small amount (BZ$ 50,000) to the MOH for hospital treatment of worker injuries, but again, these funds do not contribute to PHC expenditures.

Donor funding for PHC is not easy to determine. Accounting practices very widely among donors and often funds come from several internal budgets in the home offices of the donors, making it difficult to track actual expenditures in Belize. For instance, the PAHO office in Belize does not keep records on Washington office contributions, and Washington often does not disaggregate its special program expenditures by country.

The following chart provides an estimate of PHC funding for FY 1990/91 based on the available funding information. It is probably an underestimate.

CHART 4

ANNUAL DEPENDENCE ON DONOR FUNDING
FOR PRIMARY HEALTH CARE

US DOLLARS

draft estimates 10/15/91

DONORS	1990/91 ESTIMATES
PAHO	
PAHO/Belize	70,431[9]
PRODERE	100,634[10]
Action Plan for EPI	73,800[11]
UNICEF	66,864[12]
UNHCR	62,000
MSF	170,000[13]
A.I.D.	
CARE/MACH	141,295
BFLA	107,048
BIB	67,929
Others	
IPPF	59,204
TOTAL ANNUAL DEPENDENCE	919,205

[9]Annual allotment only, not actual expenditures

[10]Estimate for 1991/2

[11]Estimate for 1990, usually 90% executed

[12]Actual expenditures in 1990

[13]Estimate of Sustainability need for MOH funding -- excludes PRODERE funding

Of the total US$ 919,205, at least $ 441,224 is not likely to be renewed -- the A.I.D. projects, MSF, and UNHCR. If the GOB wants to replace this funding with national funds in 1992/3 it will need to allocate an additional BZ$ 882,448 to primary health care activities. One source for this additional funding might come from a partial reallocation of user fees charged at hospitals. For instance, a recent study shows that BZ$ 1,533,361 could be raised if modest increases in fees and collection practices were implemented.[14] While most of these fees should be retained at the facilities in which they are collected (in order to improve quality, incentives, and management), a portion could be used to off-set the loss of donor funds and cross-subsidize preventive care with fees collected for curative care.

C. Unit Cost Analyses of PHC Activities

Methodology

We have made unit costs calculations for four out of six MOH primary health programs. The programs are the following: Community Health Services, Mental Health, Dental Health and Vector Control. It was not possible to obtain sufficient data to estimate unit costs for the other programs. We have attributed 30% of the administrative costs from budget items: "Central Administration" and "Director of Health Services", to primary health care programs. This allocation was based on the proportion of non-administrative expenditures in PHC, and may be a high estimate since it could be argued that central level administration devotes more time and resources to hospitals because of the complexity of their services. Since administration costs were only 8.6% of total spending, the indirect costs added only 2.6% of total spending to the PHC expenditures.

We made separate calculations based on the recurrent costs for:

A. Personnel
B. Operations and maintenance
C. Drugs and vaccines

Personnel costs include the permanent and temporary personnel on salaries with the MOH during the fiscal year 1990-91. Operations and maintenance include travel and subsistence, materials and supplies, utilities, equipment and rent.

Drug estimates were obtained from two sources: the Central Medical Stores (CMS) and Maternal Child Health (MCH) program. Annual records of drug expenditures by districts or by facility were not available; however, Central Medical Stores recently introduced a database inventory system (INVEC) which reports information on facility level drug requests and cost of each dispatch. Using requisitions for 81 days (July 15 - October 4) we projected costs for the entire fiscal year, and assumed that FY 1990-91 expenditures would be the same. The difference between the projected figure and the actual FY 1990-91 figures was assigned to a separate "other" category.

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[14] Griffin and La Forgia, op.cit., pp. 18-19

The units were based on the utilization data for each program as measured by number of visits to the health center, or number of vaccinations series, or population covered by spraying.

When the appropriate data was not disaggregated according to our categories, informed assumptions were made to estimate unit costs. The assumptions and specific steps used in the calculations are described in the following analysis of each of the PHC programs.

Community Health Services

The Community Health Services program (or Maternal Child Health Components) comprises five active sub-programs: immunizations, diarrheal diseases, acute respiratory infections, pre-natal and breastfeeding.[15] Data for FY 1990/91 on the number of activities provided for each of these sub-programs was available by district from the MOH monthly statistics reports on public health nursing services.

Costs for these activities were drawn from MOH expenditure reports in Vote Control Books available in each district and the MOH central financial offices in Belmopan as described in Annex A. The costs of personnel and operations and maintenance were then allocated according to a standard time allocation model that was developed for the study. The time allocation in Belize is facilitated by the practice of scheduling specific days (or half days) to PHC activities. The allocation model first estimated broad areas of activities carried out during a normal week, based on interviews with nurses in rural and urban health centers and mobile clinics. These areas included immunization days (or half days) in health centers and mobile clinics, days (or half days) spent on prenatal care, days (or half days) spent on general medical consultation. Since ARI and diarrhea cases were seen during any type of planned session (except perhaps immunization days), from interviews we estimated that the total time spent on both was 10%. We allocated time within this 10% according to the number of patients seen and assumed that diagnosis and treatment of diarrhea and ARI took approximately the same amount of time per patient.[16] (see Chart 5)

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[15]There are two other activities, family planning and post-natal care, that are not currently active

[16]It was beyond the time and resources of the study to validate this time allocation model by observation. However, a future study of nurses time using operations research observation techniques could be used to develop an alternative model to analyze the cost data.

Chart 5

Personnel Time Allocation at Health Centers and Mobile Clinics

Immunizations	30%
Diarrhea Control	3%
ARI	7%
Pre-natal Visits	20%
Other	40%

1. Immunizations

Based on information about nurses' time[17] ...tion by MCH activities we assigned 20 percent of the tota... personnel and operations and mainten... enditures in Community Health to the immunization activity ... Next we distributed this "immunizatio... diture to each type of vaccines by the proportion of vaccine ... administered (assuming that the time ... ter vaccines is relatively equal across vaccine types).

The costs of vaccine doses was obta... procurement records (PAHO/Fondo Rotario de Medicamento... Essenciales) of the MOH. Vaccine ... available by type of dose. Syringes and freight were assigne... across districts and across ...pe of ... ccording the proportion of vaccines given. Of the 30 perce... general administrative MOH ex...endit... were assigned to PHC, 30 percent was allotted to immunization

Table 5 presents estimates of unit ... selected PHC services. The estimates for immunizations a... presented as units for each do... W... ed, the un... cost for a full series of childhood immunizations ... BZS 41.44 or US$ 20.72. U...g a ... ethodolog... or estimating unit cost of a fully immunized chil... a multi-country study by RE.ACH o... grams fou...d the average unit cost per fully immunized child ... be in the range of US$ 5.00 to US... While this comparison suggests that unit costs for EPI a... relatively high in Belize, much caution ...e used in comparisons among countries and among studies usi... different methodologies. Different ... lab..., different methods of assigning indirect costs, differe... vaccine costs from country to country ... gn...cantly affect the inter-country comparisons. It is likely, ... the least, that the labor cos... in Beli... for...ly higher than in the countries of the REACH study, whi...

[17] REACH. The Immun...ion S... lity Study, April 1990. page 6.

would partly explain these differences.[18] However, the difference is not fully explained by higher labor costs. It is also likely that Belize has a low population to health staff ratio, which would also increase unit cost because normal waste and inefficiencies are magnified when distributed over low numbers of beneficiaries With these caveats, it is not clear that the estimate used in this study should be taken as significantly higher than other unit costs estimates for other countries. (See Table 5)

Nevertheless, with this figure as a base line we can analyze the internal differences to begin an analysis of the efficiency in the immunization program. Table 5 displays the variations in unit costs from district to district. Unit costs in Cayo and Orange Walk districts were generally below the average for the whole country and above average in Belize district.

We might expect higher unit costs where populations are dispersed -- as in Dangriga and Toledo -- since the effort to reach such populations might increase the cost of each immunization dose. However, it is Belize City with the highest population served that has the highest unit costs. As will be discussed below in Section V.E., this high cost is in part due to the skewed personnel and drug distribution which has assigned more staff and distributed more PHC drugs in the Belize District than is appropriate in relation to services delivered and target population.

Further analysis of the variation of unit costs is necessary to determine plausible explanations and to identify areas for improving efficiency. The differences identified suggest that operations research studies should be implemented to seek ways to improve efficiency in the immunization program implemented in Belize City where unit costs are highest and where demand differences do not explain the high costs.

2. Diarrhea Control and Treatment of Acute Respiratory Infections

In order to obtain unit costs for diarrhea control and treatment of acute respiratory infections (ARI), we estimated time according to the number of cases and approximate time necessary to treat each case. Number of cases was obtained from monthly statistical reports from each health facility. Diarrhea was assigned 3 percent and ARI 7 percent of the total personnel time, and similar proportions of the indirect administrative costs for PHC programs and of PHC drugs.

Average unit costs for the country for treatment of a diarrhea episode was BZ$ 15.49 (US$ 7.75). This figure is within the range reported in an eight country study for the World Bank, which found average cost per child

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[18]This study was not able to make a detailed comparison of labor costs among countries, however some illustrative comparisons may be useful. A Rural Health nurse in Belize was assigned a base annual salary of US$ 3,804 in FY 1990/91. A comparable nurse in Nicaragua was assigned only US$ 1,440 and in El Salvador a Rural Nurse earned US$ 2,964. With a salary level of between 1.3 and 2.6 times higher than neighboring countries, unit costs of services in Belize must be higher, since labor costs are a major portion of the costs of these services.

treated to be between US$ 0.70 and US$ 9.70.[19] The finding of unit costs at the high end of the range is probably due both to higher labor costs (see above) and to the low demand for diarrhea treatment in facilities (only 1,762 annually). Variation from district to district showed that where the demand was highest (Toledo with 605 cases) the unit cost was lowest (BZ$ 8.0) and that the lowest demand (179 in Corozal) had a high unit cost (BZ$ 17.8). However, again Belize City, with the second highest demand (269), had the highest unit costs. As with immunizations, it is advisable that operations research be implemented to seek ways to improve efficiency in provision of services in Belize City.

Table 5 also shows unit costs for treatment of episodes of ARI. The country average was BZ$ 10.95 (US$ 5.48) per treatment. We were unable to obtain international comparative figures at this time, however, this figure does not appear to be out of line with other unit costs in the country. Again, unit costs in Belize City were much higher (BZ$ 26.2) than in the rest of the country.

3. Prenatal Control Visits

Prenatal visits are a major portion of the activities of nurses in the Community Health Program. In 1990 the number of prenatal visits attended was 30,851. We estimated that nurses devoted 20% of their time to these control visits. As Table 5 shows, the unit costs of these visits were relatively low in comparison to other PHC services, despite the high percentage of time and indirect costs assigned to the service. In 1990 the unit cost per visit was just under BZ$ 6 (US$ 3). Here again, Belize City had higher costs than the rest of the country.

Mental Health

There is one budget for mental health and it is directed towards Rockville hospital in Belize city. Rockville hospital does inpatient and outpatient care. The outpatient work is delivery at Cleopatra White in Belize city plus mobiles. Each district is visited once a month per two days. Although there was information on cases attended by district, because the costs were not segregated by district, we have only estimated the country level unit costs for mental health visits. Furthermore, we were unable to disaggregate hospital care from outpatient care in this analysis. Nevertheless, the unit cost per patient visit was comparatively low at BZ$ 19.4.(Table 5)

Dental Health

Dental health program is mainly preventive. Certain days in each districts are devoted to extractions, filling are only given to the priority group (children aged 6-10). Vote control books in each district provided the personnel costing figures and MOH Statistics Office at Belize City was the source for number of patients attended.

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[19] J. Martinez, M. Phillips and R. Feachem. Health Sector Priority Review: Diarrheal Disease. World Bank (HSPR-21), April 1991.

Table 5. MOH Unit Cost Estimation of Some Selected PHC Services
FY 1990-1991 Current Prices

	Belize			Corozal			Orange Wlk			Cayo			Dangriga			Toledo			Country	
	Total Cost	Pop Served	Unit Cost	Total Cost	Pop Served	Unit Cost	Total Cost	Pop Served	Unit Cost	Total Cost	Pop Served	Unit Cost	Total Cost	Pop Served	Unit Cost	Total Cost	Pop Served	Unit Cost	Total Cost	Unit Direct Costs
Community Health																				
Prenatal	67,690	8,855	7.6	23,018	4,431	5.2	25,904	4,967	5.2	26,341	5,783	4.6	17,518	4,056	4.3	21,501	2,759	7.8	181,971	5.91
ARI	21,566	823	26.2	7,874	763	10.3	9,654	1,171	8.2	8,171	673	12.1	7,183	1,184	6.1	9,241	1,204	7.7	63,690	10.45
Diarrhea	9,313	269	34.6	3,190	179	17.8	3,549	189	18.8	3,687	256	14.4	2,743	264	10.4	4,814	605	8.0	27,236	15.43
Immunization B	9,375	1,738	5.4	3,101	1,009	3.1	3,197	1,106	2.9	3,816	1,471	2.6	1,993	702	2.8	2,299	687	3.3	23,782	3.54
4 dose DPT4	33,897	6,077	5.6	12,597	3,824	3.3	14,542	4,612	3.2	13,497	4,896	2.8	8,388	2,731	3.1	13,687	3,689	3.7	96,608	3.74
4 dose Polio	32,476	6,082	5.3	11,384	3,738	3.0	12,622	4,367	2.9	11,971	4,775	2.5	8,524	2,970	2.9	10,876	3,193	3.4	87,864	3.90
2 dose Measles	18,863	2,975	6.3	6,980	1,734	4.0	8,930	2,279	3.9	12,465	3,389	3.7	5,819	1,499	3.9	8,733	1,910	4.5	61,789	4.46
3 prenatal imm	6,621	1,224	5.4	2,174	705	3.1	2,529	858	2.9	1,869	756	2.5	1,677	574	2.9	1,166	348	3.3	16,016	3.90
Mental	801,055	41,304	19.4	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	801,055	19.41
Dental	85,266	5,541	15.4	43,334	750	57.8	31,676	1,448	21.9	36,686	1,034	35.5	32,256	1,247	25.9	0	0	0.0	229,217	22.93
Vector Control	398,729	112,262	3.6	181,376	65,380	2.8	164,530	61,380	2.7	278,124	70,308	4.0	142,526	70,000	2.0	176,091	49,000	3.6	1,341,376	3.11

Notes:

(1) 30% of General Administration and General Services Recurrent Costs have been included in PHC costs
This total have been distributed according to the following formula:
Immunizations 30%, Prenatal 20%,ARI 7% and Diarrhea 3%

(2) From total Comunity Health Services costs we have substract vaccines (to avoid double counting) and then distributed according to the formula:
Immunizations 30%, Prenatal 20%,ARI 7% and Diarrhea 3%

(3) Vaccinations accounts for $82 61,137 which has been added to the Immunizations Costs

Dental health unit costs averaged BZ$ 22.9 per patient attended for the whole country.(Table 5) This figure varied significantly from district to district in relation to the number of patients served. In this case, Belize City with a very high proportion of the total (55%), had the lowest unit cost (BZ$ 15.4).

Vector Control

DDT and Malathion spraying is conducted every year for malaria and dengue control. Spray teams are dispatched to several districts, but teams, which include temporary local personnel, are paid in each district from the district personnel budget. Teams include spraymen, supernumeries, inspectors, and inspectors' aides. In each district there is a permanent microscopist.

The operations and maintenance costs are administered in Belize city, but expenditures are distributed by districts, making it possible to allocate costs by district. Spraying activities were also disaggregated by district, making it possible to assign district level unit costs.

Total annual expenditures include annual costs of Malathion, however, they do not include the costs of a donated multi-year supply of DDT from the Government of Mexico.

Unit costs per person covered by spraying were BZ$ 3.13, varying from a low of BZ$ 2 in Dangriga district to a high of BZ$ 4 in Cayo.

Several other studies have estimated costs of alternative methods of vector control and are being used by the government to estimate budgets for national and donor proposals.[20] These studies do not present unit costs by person covered, their units are per spraying cycle, based on estimates of coverage needed to spray 15,000 houses. Most other studies compare alternative costs of using different insecticides, rather than evaluate the efficiency of the actual expenditures. Time did not allow us to do a more detailed analysis of the efficiency of vector control program. Such a study would need estimates of malathion expenditures and proportion of spraying that used donated DDT. It would also require analysis of the density of population and geographic dimensions of target areas for spraying. We recommend that such analysis be done to begin to evaluate the efficiency of the current program, before initiating alternative projects.

General Conclusions on Unit Cost Analysis

Unit cost analysis in general suggests that PHC services in Belize may be somewhat higher than in other countries, although we caution against making direct comparisons with alternative methodologies and among countries with different labor costs and different population-to-staff ratios. There is cause for seeking improved efficiencies, however, since we found that unit costs tend to be highest in Belize City. We suggest that measures to improve efficiency be initiated in that district.

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[20]Andy Arata, personal communication

Projections of Future Funding Needed to Reach 1996 Goals

Although MOH has achieved fairly high coverage in immunization, diarrhea control and ARI coverage, it ha set higher goals in its plans for the next five years. With the unit costs for three child survival programs we are able to estimate the costs of reaching MOH goals for these programs.

In order to determine future funding needs for achieving MOH targets in immunizations, ARI, diarrhea control we estimated growth in the target population based on the current number of live births and a 2.5% growth rate over the next five years and multiplied it by the target percentage noted below in Table 6. Using unit costs based on our estimates for current coverage levels, we projected future costs of immunizing this population for five years.

It should be noted that this method is different from an alternative methodology used by Forgy, et. al. to estimate costs of reaching Talloires Child Survival goals.[21] The Forgy methodology developed a formula for calculating the costs of reaching child survival goals that would account for the increasing difficulty of covering additional children at the higher level of coverage. In our initial estimations, there was little difference between the linear assumptions of our model and the non-linear assumptions of the Talloires analysis.

Table 6

MOH Child Survival Goals

	Current Coverage	1996 Goal
BCG	80%	95%
DPT	84%	90%
Polio	80%	90%
Measles	30%	90%
Tetanus Toxoid	70%	80%

The analysis presented in Table 7 suggests that the MOH will need a total of BZ$ 1,593,612 to reach its immunization targets. With current annual expenditures of BZ$ 286,069, this means an additional BZ$ 32,653 must be allocated to the immunization program annually to reach the goals by 1996. It will be necessary to continue to allocate this amount (plus additional funds to account for population growth) every following year

[21] Larry Forgy, et. al., Costing of the Talloires Child Survival Goals. Abt Associates. September 1990.

to maintain these coverage levels. This additional expenditure seems well within possible reallocation o current MOH resources.

Table 7

Five Years Plan FY 1992-1993 to 1997-1998
Total Country Estimation for Reaching Child Coverage Goals

	Series Unit Cost	(1) Target Population	(2) 5 year Estimation BZ$ 000	Total 1 year Cost
Immunizations				
1 dose BCG	$3.54	34,592	$116,422	
4 doses DPT	$14.96	34,592	$465,782	
4 doses Polio	$13.99	34,592	$435,445	
2 doses Measles	$8.94	34,592	$278,469	
3 prenatal immunizations	$10.75	34,592	$297,494	
Total Vaccination Costs	$52.19		$1,593,612	$318,722
Current Annual Expenditure				$286,069
Annual Gap				$32,653

Notes:
(1) Target population based on live births of 6581 and 2.5% growth rate
(2) Target coverage based on MOH objectives 90 percent for all except prenatal inmunization is 80 percent and BCG 95

Table 8 shows a similar analysis for reaching goals of treating 100% of the anticipated future diarrhea episodes. based on current figures. This estimate suggests that current levels of expenditure are more than adequate for reaching the 100% target. However, as noted above, the unit costs for each episode appear to be quite high and the number of episodes is quite low already.

Table 8

Five Years Plan FY 1992-1993 to 1997-1998
Total Country Estimation for Treating Diarrhea

	Unit Cost per Episode	Total Number Episodes	Total 5 years Costs	Total 1 year Cost
Diarrhea (1)	$15.49	5,535	$85,743	$17,149
Anuual FY 1990-1991 Expenditure				$27,296
Annual Gap				($10,147)

Notes:
(1) Treated Episodes based on actual number of episodes from 1990 and 2.5% population increase

The costs of treating 100% of the anticipated ARI episodes was based on the current number of episodes an additional 2.5% based on population growth. In order to treat these episodes, MOH should alloca additional BZS 277,196 annually for the next five years. (See Table 9)

Table 9

Five Years Plan FY 1992-1993 to 1997-1998
Total Country Estimation for Treating ARI

	Unit Cost per Episode	Total Number Episodes	Total 5 years Costs	Total 1 year Cost
ARI (1)	$10.95	155,698	$1,704,432	$340,886
Anuual FY 1990-1991 Expenditure				$63,690
Annual Gap				$277,196

(1) Number of Episodes based on actual number episodes from 1990
by 2.5 the annual population growth rate

The total additional resources necessary each year for the next five years in order to reach the Child Survival targets set by the MOH are BZ$ 299,702 assuming that resources not needed to reach diarrhea targets can be reallocated to EPI and ARI.

E. Special Issues in Primary Health Care

Community Health Worker Program

As was noted above, the Community Health Worker programs in Belize were initiated by NGOs such as CARE, MSF, and PCI, with funding from major donors (AID, Holland, UNDP) almost all of which will end in 1991 in what might be called the "nightmare of the Child Survival bandwagon". As occurred in Central America at the end of the 1960's when both AID and UNICEF decided to end their funding for malaria eradication programs, countries that have become dependent on donor funding for Child Survival are facing the threat of significant reductions in external support, and will have to seek internal sources to sustain these activities. Belize is facing this event with a major commitment to continue the programs -- and to alter them according to their own plans and priorities. The following analysis is an attempt to review the costs of these programs in order to provide important information for government policy in this area.

With the exception of the CARE project, we were unable to get expenditure data for these projects, although MSF did prepare a "sustainability" budget estimate of what would be needed to continue its program once the funding stopped. The actual operating budgets of these programs, however might not be particularly useful for estimating the future costs of sustaining the CHW programs. There are several reasons for believing that these estimates do not provide a very use basis on which to estimate the likely future financial inputs the MOH will have to make: First, even if the)H were to run the same program there would be different costs: (i) substantial international technical assist and involvement in management, and (ii) the up-front "capital" investment in designing training materials raining a substantial body of CHWs. In addition, the MOH is likely to run a rather different program s: ne MOH has agreed to provide CHWs with a stipend of BZS 50 per month (some donors did not pay C - , salary) and may train more CHWs, thus producing potential economies of scale.

It was felt that unit cost analysis would pr nportant data on the efficiency of the use of resources in this program as the MOH prepared to assum responsibility.

The following analysis uses as its princip

1. Activity and time allocation re e CARE project in Orange Walk and Corozal -- the only program to produce systematic n ports on actual activities and the CHWs' own account of hours spent on activities.

2. Expenditure data on the CARE

3. The projected CHW budget 1992/3, the first full year that the MOH will assume responsibility for almost all costs (gram (with the exception of US$ 100,000 from PRODERE)

The methodology used in this section took all project costs (except the 6 months of international technical assistance) for the year 1990 and divided them according to the percentage of time CHWs devote to different activities (Table 10). Then the total number of activities accomplished in a year was calculated from the data from two quarters of monthly reports (Table 11). This figure was used to determine unit costs for 1990. A similar process was used to analyze the MOH FY 1992/3 proposed budget, with estimates for increased production from the larger number of CHWs that will be incorporated into the program (Table 12).

TABLE 10

CARE CHW PROGRAM

TIME ALLOCATION	
Family Visits	35.7%
House Counselling	23.9%
Mobile/Health Clinics	34.5%
Weighing Days	1.8%
Village Meetings	4.1%

TABLE 11

CARE COMMUNITY HEALTH WORKERS

ESTIMATES OF ANNUAL ACTIVITIES FOR 98 CHW

Family Visits	2,694
House Counselling	1,678
Mobile/Health Clinics	466
Weigh Days	54
Village Meetings	136

TABLE 12

CHW PROGRAM IN ORANGE WALK AND COROZAL

BZ DOLLARS

	Actual 1990/1 CARE Project	MOH 1992/3 Budget Estimates[22]
Total Cost	282,590	245,448
Personnel	148,290[23]	170,098
Training	2,628[24]	12,084
Other	131,672	63,266
Unit Costs		
Family Visits	37.44	32.52
House Counselling	40.24	34.96
Mobile/Health Clinics	209.22	181.72
Weigh Days	94.20	81.82
Village Mtgs.	85.20	74.00

The results are surprising. The unit costs are quite high for all activities. The cost of a Family Visit (BZ$ 32) is five times what might be charged for a visit to a physician in a district hospital (BZ$ 6) under a proposed program to recover all costs in hospitals.[25] Another comparative benchmark is an estimate that

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[22]Includes 36.7% of Belize City Administrative Costs Allocated to the two districts

[23]Does not include payments to CHW, which were not initiated until September 1991

[24]Training expenses for 1990-91 were abnormally low. In 1989-90 training expenses were $7,955 and projections for May-December 1991 were $11,821.

[25]Griffin and La Forgia, op. cit.

comes from another study of unit costs in Belize. This study of the total MOH funding for Maternal and Child Health, including in this case, hospital maternity care and post-natal care, estimated the annual costs of providing this care to be BZ$ 30 per mother and child.[26]

While Mobile Clinics and attendance at Health Posts/Centers may not be a particularly useful unit -- since many patients may be seen, it would be more appropriate to examine number of patients attended during these clinics as a unit -- there was no available data to determine alternative units for this apparently high cost activity. Nevertheless, since several CHWs usually attend mobile clinics and health centers, and the costs of nurses and drivers, etc. have not been included in this analysis, the costs seem high unless the clinics and centers are flooded with patients -- which is unlikely.

Policy Issues

The analysis of the unit costs of CHW program in Orange Walk and Corozal raises some key issues for policy. The analysis suggests that the cost per type of service is quite high under the current organization and with the projected MOH budget. This analysis is preliminary and should be reviewed in more detail along with studies of other CHW programs in the country. Nevertheless, it does suggest a profound need to make the program more efficient in the delivery of services.

It should be noted that relatively high unit costs should be expected for effective outreach programs. First, house visits and time-consuming one-on-one education programs cost more per unit than visits to fixed sites where many patients can be seen at a time -- lowering unit cost per patient. Second, outreach programs are very important in reaching the population at highest risk and those least likely to seek care when they need it. It costs more to reach the marginal population than it is to accommodate those who seek care. Third, studies show that community workers need considerable supervision and training in order to be effective. Many programs that fail to provide significant levels of supervision and training have failed to maintain services and have little demonstrable impact. Intensive supervision requires additional costs.

Nevertheless, if the findings from Orange Walk and Corozal -- the CARE project area -- are validated by similar findings in other CHW program areas, the MOH should seek ways to reduce unit costs per service. Several options should be considered:

Short-term:

1. Expand the Number of CHW

2. Reduce the supervision and administrative costs

3. Review incentives to increase productivity of each CHW

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[26]James N. Becht and Nicholas Danforth, Maternal and Child Health Care Costs in Belize. Consultative Group on Development, August 1989.

Long-Term:

The MOH should review cost-effectiveness of the CHW program through studies of the impact of program on health levels and coverage, as well as KAP. In this process, the MOH should also evaluate how CHWs can be used to address prevention of the growing adult disease problems coming with the demographic transition.

These options will be reviewed below.

Expand the Number of CHWs

The high unit costs are partly attributable to the relatively low number of CHWs providing the direct services. This means that relatively fixed administrative, supervisory, and training costs are not being efficiently used. If the same "overhead" costs could be distributed over a greater number of CHWs (and if these additional CHWs can provide similar services to the current CHWs) then the unit costs would decline, even though the additional CHWs themselves imply an additional cost.

For instance, if 100 additional CHWs were assigned to Orange Walk and Corozal they could provide about 100% more services but they would imply only approximately 30% additional costs (in salaries and training) the first year and only 24% additional costs each succeeding year. The unit costs per family visit would then decline from BZ$ 32 to BZ$ 21 the first year and BZ$ 20 the following years.

This option should be considered only if it is determined that the additional CHWs can be absorbed and will provide similar (or more) services to the existing CHWs. Current distribution of CHWs should be reviewed to determine areas where additional coverage is necessary and feasible.

Reduce Administrative and Supervision Costs

Administrative and supervision costs in the program are quite high and could be reduced if districts were combined. This reduction in staff might affect the quality of the program since high levels of contact between supervisors and CHWs appear to be important for retention and effectiveness of the program. Options should be carefully reviewed to see what the potential impact of reductions would be on the work load of the remaining supervisors and administrators. It is likely that some reduction in supervisory visits can be tolerated, however, the impact of reductions should be monitored by reviewing activity reports and attrition rates.

If four districts are combined into two, the annual savings would be around BZ$ 92,000 -- a reduction of 6% in the unit costs.

Incentives to Increase Productivity of CHWS

Now that most CHWs have just begun receiving a BZ$ 50 monthly subsidy, it might be possible to review their activity schedules to determine if they can be expected to make more family visits and/or participate

in more mobile clinics and health center activities in return for this subsidy. Since the subsidy is being given currently without any expectations of increased productivity, now might be the best opportunity to use it as an incentive. Later, when CHWs are accustomed to receiving the subsidy, they will not be motivated to increase productivity without additional incentives.

Implement a Cost-effectiveness Study and Reorientation of CHW Activities

Two recent KAP studies of the CARE program have shown two key elements in the CHW program. First the level of knowledge attitudes and practices even before the program began in 1987 was quite high compared to similar studies in the region. Levels of knowledge and practices about immunizations, breast feeding, family planning and ORS for instance were generally high. Nevertheless, the second KAP study in 1991 showed the program to be quite effective in increasing knowledge and practices to extremely high levels. For instance, over 95% of the children were immunized, and 88% of the women were able to tell how to prepare ORS correctly. It is important to recognize that improving on already high levels of knowledge, attitudes and practices is more difficult than making the initial gains where little knowledge exists; therefore the KAP studies show that the program has demonstrated a significant impact. It is also likely that to maintain high levels, continuing CHW activity will be necessary.

Nevertheless, in relation to its costs, the program should be reviewed in terms of its potential impact on health levels. This type of study requires careful study design and significant external resources to be technically adequate. Donor funding should be sought to implement such a study.

A second issue that could be raised is the potential role of CHWs in addressing the changing demographic and epidemiological patterns. There is a need to begin to address preventive programs toward adults for life style changes and for problems of accidents. CHWs may be an appropriate resource to address these issues in addition to the MCH focus that they currently receive.

One option would be to implement an operations research study to explore whether CHWs can be trained in these life-style issues and can have some impact on the knowledge and practices of those they serve.

Personnel and Drug Allocation Issues

Tables 13 and 14 show an analysis of the expenditures for personnel and for drugs by district and compares them to population of those districts. This analysis suggests that there may be a misallocation of personnel and drugs toward the Belize City district.

Table 14 shows that Belize City district, with 30.4% of the total population, has 67.1% of the personnel expenditures of the MOH, leaving much lower personnel-to-population ratios in the other districts. It is not unusual for urban areas with concentrations of specialized hospital services to have higher personnel to

population ratios; however, the magnitude of the differences in distribution should be cause for concern. It is likely that this distribution contributes to the high unit costs for PHC services.[27]

This distribution pattern should be analyzed by a special study of personnel efficiency in order to determine a more appropriate relationship between personnel and catchment area population.

The maldistribution of PHC drugs is even clearer. There is no obvious reason for more PHC drugs to be dispensed in a district with specialized hospital services. In our analysis we did not include drugs dispensed to hospitals in the category of PHC drug expenses. As Table 14 shows, almost 70% of the PHC drugs are dispensed in Belize City district where only 30 percent of the population lives and where only 26% of the total PHC visits occur (Annex D).

Additional study is necessary to determine the causes of this inappropriate distribution pattern. It might be useful to consider such a study as part of the tasks of the project that is upgrading the pharmaceutical information system.

VI. CONCLUSIONS AND RECOMMENDATIONS

This study of recurrent costs of primary health care in Belize raises some major issues for policy consideration, as well as some short-term recommendations for adjustments in current on-going programs.

A. Policy Issues

Need for Additional National Funding

The MOH faces declining financial support at a time when it has additional resource needs in order to reach established PHC goals, and when additional burdens will be placed on the system by the planned Belize City Hospital.

Funding for the health sector from its traditional sources is likely to decline in the coming years. The study found that, after increasing steadily over the period FY 1986/7 to FY 1989/90, national budgetary support, in real terms (constant dollars), has declined in the last year. In addition, key support for primary health care activities is being phased out during this current year and the government is committed to absorbing much of these costs -- especially in the CHW program. Donor funding that is not likely to be replaced amounts to at least BZ$ 800,000.

As the projections of the gap between current spending and the costs of reaching 1996 goals suggests, an additional BZ$ 299,702 will be needed each year for the next five years to reach these goals.

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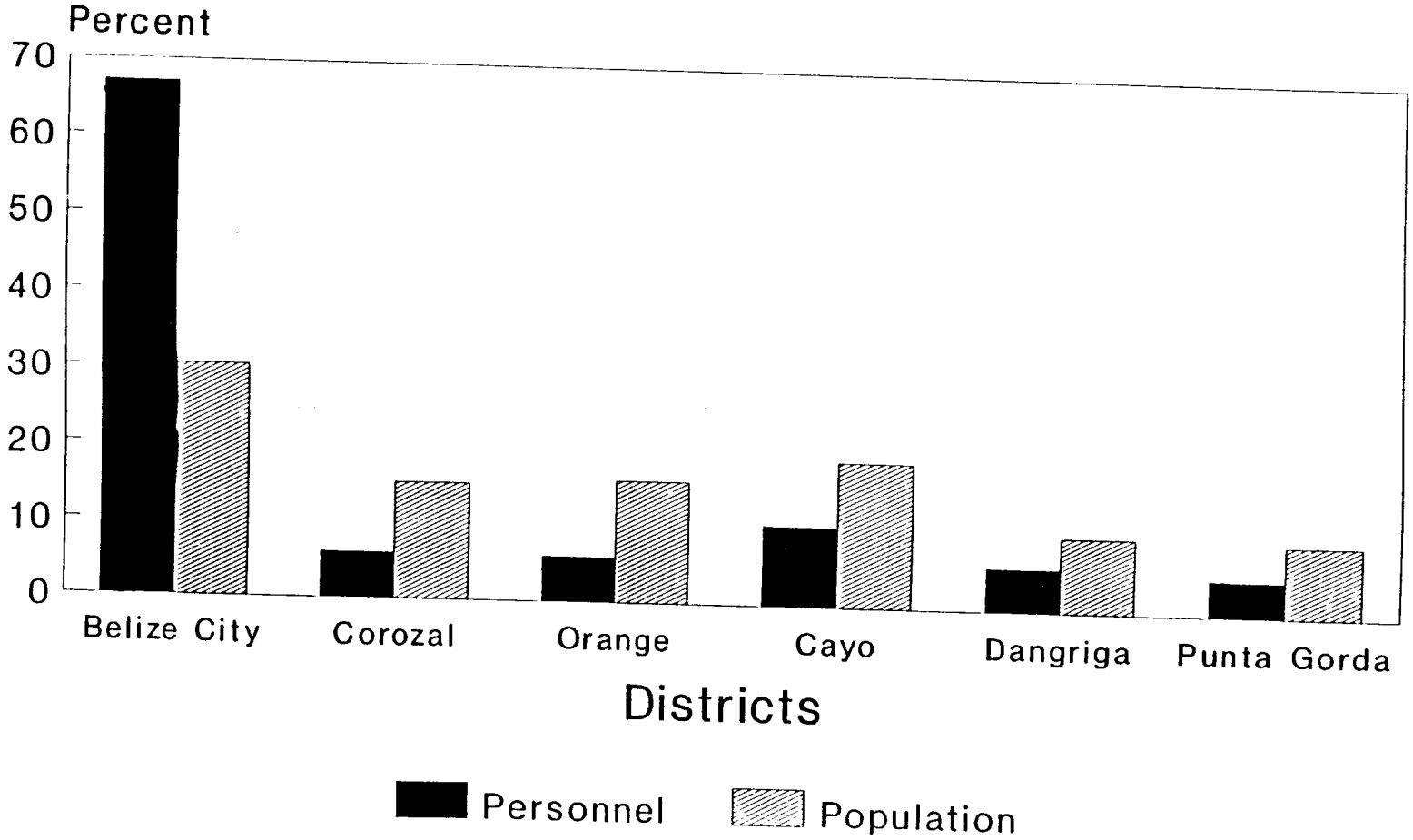
[27] Further analysis would be necessary to disaggregate PHC personnel from total personnel in order to determine the magnitude of the effect of personnel expenditure on unit costs of PHC services.

Table 13

MOH Personnel Expenditures & Population

Estimation by Districts

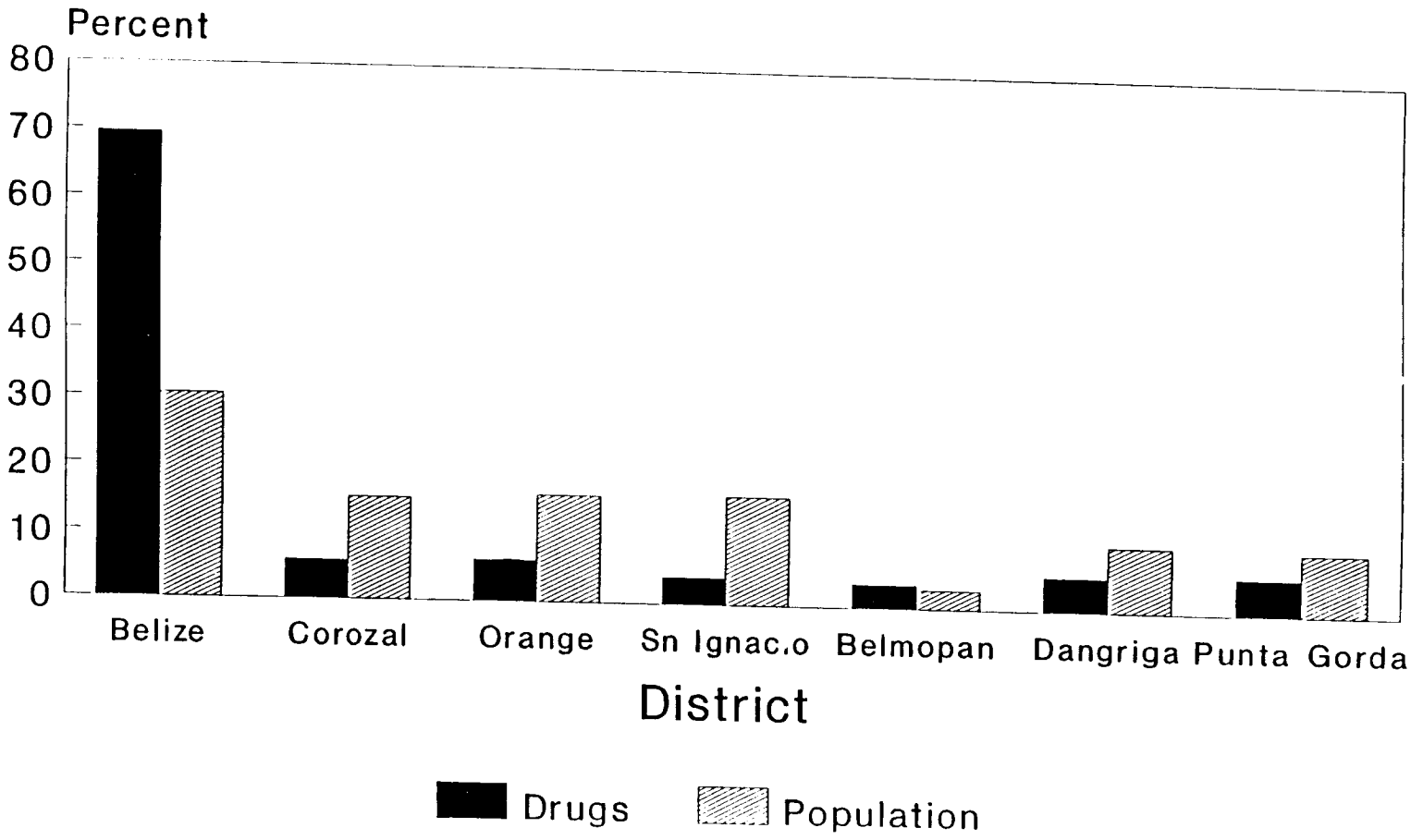


Source: Annex E
MOH, Nat'l Health Planning

Table 14

MOH PHC Drugs Expenditure & Population

Estimation by Districts



Source: Annex F
MOH, Nat'l Health Planning

Where will this additional funding come from? The traditional sources could be tapped. Some additional funding is needed from the national budget. MOH share has declined in recent years and an argument can be made to at least restore earlier public funding levels. However, even this addition will not be enough to cover additional expenditures implied by the MOH 1996 targets for PHC. Other donor sources are unlikely to be available for new funding in the health sector -- funding patterns globally are shifting away from health and away from Central America.

It seems clear that some form of generating revenue from patients will be necessary to sustain essential PHC activities and expand them. As suggested by Griffin and La Forgia, cost recovery in the hospital sector is a major untapped source of funds for the MOH.[28] While most of the funds recovered from current cost-recovery proposals must be retained by the facilities that provide the service, a portion of the fees could be reallocated to cross-subsidize PHC programs. The MOH might also consider cost-recovery activities within PHC programs themselves.

The MOH will need to find some source for the additional financing needs, if indeed, it is to reach the goals it has set for itself.

Policies for the Demographic Transition

In general the health and health service statistics suggest that MCH health status is good in Belize. For example, immunization coverage of children under 1 year of age is estimated at 85% for BCG, 60% for DPT3, polio3 and measles (Becht and Danforth, 1989) and the burden of immunizable diseases has fallen significantly in the last decade, with almost no reported cases of TB, diphtheria, neonatal tetanus or polio in the last 5 years.

On the other hand the morbidity and mortality statistics show adult chronic diseases to be of increasing importance (already some health centers provide special days for diabetic and hypertensive patients). These diseases are difficult and often expensive to treat curatively and will impose a growing financial burden on the health system. It makes sense now to start thinking seriously about developing preventive strategies to reduce the incidence of these adult diseases. For instance, current investments in screening for cervical and breast cancer, nutritional promotion, discouraging smoking, improved traffic safety could reduce future costs of these diseases. Many of these preventive strategies require cooperation and investment from outside the MOH per se, suggesting that strengthening interministerial and intersectoral ties is highly desirable. Education is also a key element, especially in a country with such high levels of adult literacy (95%). Indeed, there have been some apparent successes in preventive campaigns already, such as the program to prevent poisoning.

The MOH should begin to develop a broader program in prevention of adult health problems. As part of this broader strategy, it might consider reorienting the CHW program to make it more effective and efficient. CHWs now trained in MCH could be given additional training and tasks to complement broader

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[28] see footnote 3.

programs in prevention of smoking, improved diet, screening, alcoholism, accidents, etc. If the MOH begins such a program it could provide an important innovative approach that other countries entering the demographic transition could emulate.

Improving Administration and Planning

This study has demonstrated a significant decline in the funds available for central administration -- the core activities of which are planning, programming, data collection and financial system controls. Repeatedly we have found weaknesses in administration, budgeting and planning in our search for data for this study. There is a clear need to strengthen the planning and budgetary process and the data base which should inform it.

Although the MOH in Belize is highly centralized in terms of planning, decision-making, financial management and information flows, there are very few staff at central level. Many directors of health programs manage their programs more or less single handedly with minimal back-up and some have important clinical responsibilities as well: for example, the Director of Dental Health is one of only the few dentists providing government services in Belize City.

There is no fully trained epidemiologist in the country. More importantly, perhaps, there is no area within the Ministry which is formally responsible for research in the field of public health. The creation of a position for someone to undertake and manage epidemiological investigations into the nature of health problems and the impact of health activities, would not only lead to a strengthening of the data base but would also be a signal to program managers of the importance of taking epidemiological characteristics into account in program planning, budgeting and evaluation.

One of the keys to good planning and management is reliable data and its translation into useful information. The MOH statistical office has a dedicated team but there are problems with the quality of information available: a recent study, for example, revealed that maternal mortality rates had been under-estimated by 50% using routinely gathered statistics; private sector clinicians did not share data with MOH: and district level and health center staff did not give the impression of being well informed about the epidemiological profile of their population.

Managers at all levels (from central through district to health centers) also have little idea of the value of the resources being used in their programs, districts or centers: poor quality control leading to easy opportunities for corruption and inefficient usage (such as, "first in first served"). An interesting program to at least partially rectify this is being attempted through a revamping of the system of ordering and distributing drugs.

The public sector budget is prepared in November for the following fiscal year (April 1 to March 31). The budget can be adjusted at the end of the first 6 months, but no extra funding can be approved before 6 months. The MOH budget has repeatedly been supplemented, however, managers tend to use the historical budget as the basis for budget requests, rather than planning on the basis of a planning exercise.

Due to a complex process of gaining Ministry of Finance approval there is a lack of opportunity for negotiation between managers and budget decision-makers. Expenditures cannot be switched between line items within a vote without prior approval within the MOH and expenditures between "heads" of votes cannot be shifted without MOF approval.

There are some instances where appropriate resource allocation strategies have been attempted but have in effect been thwarted by inflexible budgeting procedures. For example, the Director of Mental Health has in recent years been promoting community level approaches with an emphasis on house visits. Success has been such that admissions to the mental hospital have fallen sharply. The Director, however, has been unable to get approval for a budget which reflects these programmatic changes, and the hospital continues to get a substantial share of the budget, while the clinic and community work is underfunded. Much of the budget is for food for inpatients which cannot be reallocated to other more useful line items (for example transport) without approval from the Ministry of Finance. The hospital also has a surplus of domestic and maintenance staff when what is needed is more professional staff to work in the clinics and with the community.

Some of these improvements to planning and management can only be achieved with commitment to investment in additional staff (support for program managers and research), but many could be handled with one time changes in procedures.

District medical officers do handle some of the district level payments (salaries and the hospital budget) and have limited discretionary powers over the use of resources in their district (eg the hospital budget) but essentially no control over the way resources are distributed or utilized in their districts. They have no power over nursing staff and exercise little control over the way drugs are utilized in the district.

These management and administrative problems suggest the need for a major revamping of administrative procedures for planning, budgeting and financial management and control. They also suggest the need to address the significant decline in resources available for central administration.

B. Short Term Adjustments

Inefficiencies in the allocation and utilization of resources in Belize City. The allocation analyses and the unit cost analysis suggest that resources are inappropriately concentrated in Belize City district and that they appear to be inefficient in implementing key PHC activities. Operations research projects should be developed to identify specific problem areas where efficiencies can be achieved in EPI, ORT and ARI. Personnel efficiency studies should be implemented to identify a more rational distribution of personnel across districts. The skewed nature of pharmaceutical distribution might be addressed through the current INVEC project activities of MSH.

High unit costs of CHW Program. As noted above, the unit costs of the CHW program are extremely high and a variety of strategies should be adopted to lower those costs. These strategies include: 1) expanding the number of CHW; 2) reducing the supervision and administrative costs; 3) providing incentives to increase productivity of each CHW. In addition, as part of a broader reorientation toward

prevention of chronic diseases, alcoholism, and accidents (the demographic transition policy), CHWs might be retrained to address these issues in their house to house visitations.

ANNEX A

METHODOLOGY

ANNEX A

METHODOLOGICAL DETAILS

Consensus on objectives with MOH

A meeting was held at an early stage with the Minister of Health (Dr Theodore Aranda), the Permanent Secretary (Mr Fred Smith) and the Director of Primary Health Care (Dr Rao). This meeting was important in clarifying the objectives and purpose of the study.

Defining PHC

The meeting also helped in reaching some consensus on the scope of the exercise and, in particular, what was understood by the term PHC. 'PHC' is the title given to a very specific program within the MOH which is concerned with the training and supervision of community health workers. This program is currently of special concern to the MOH because of the coincidentally simultaneous withdrawal of support from a variety of nongovernment organizations (NGOs) who were previously providing crucial financial and technical inputs to the CHW program.

In discussions with MOH officials, it became clear that it would be useful for the present study to focus special attention on this CHW program. However, it was also agreed that the study should not be restricted to analyzing this one, relatively small, program and should adopt a wider, more conventional, definition of PHC. After studying the budgetary and administrative structures in the MOH we decided to use a functional definition of PHC to include:

- all the activities at the rural and urban health centers;
- the CHW program;
- all the activities of the MCH: well baby (including vaccination, weighing) pre-natal, post-natal, and health education programs;
- all the district level activities of the vector control, environmental sanitation, dental health; and
- the community center and mobile activities of the mental health program.

Water supply and sanitation, while recognized as PHC, were not included in the study since very few of the costs were recurrent in nature.

Defining MCH as part of PHC

For the purposes of this study, we defined MCH to embrace pre-natal, post-natal care, well-baby (including vaccinations) and treatment of childhood illnesses (principally diarrhoea and ARI) conducted at the urban or rural health centers and mobile clinics. The activities of the BFLA and BIB were also included in a separate

analysis. The CHWs who were on MOH payroll and the Division of Primary Health Care were included in the budgetary analysis. A separate analysis was made of prospective costs of the program once it is fully assumed by the MOH. It was not possible to include an analysis of the activities of the TBA. We did not include MCH activities at the hospital (either deliveries or outpatient care).

Data collection - MOH financial statistics

The financial year in Belize runs from April to March. The MOH budget has 21 functional divisions or programs ('heads'), not all of which coincide with the organizational structure of the Ministry (see Table 1).

Each budget head is divided into 6 subheads (and further broken down into items). The subheads are types of inputs:

Personnel emoluments
Travel and subsistence
Materials and supplies
Other operating
Utilities
Rent (largely for vehicles)

Annual budget estimates and actual expenditures are recorded by these heads and subheads in the "estimates" books available from the central administrative office in Belmopan. This was the source employed for the analyses of trends in recurrent expenditure (between 1986-1990), and the relationship between MOH expenditure and GNP and total government expenditure. Data for the most recent year (1990) had not yet been compiled and had to be collected for this study from the vote control books kept for each of the major budgetary heads (program areas) and subheads (inputs) in the MOH and available from financial clerks and the accountants based in Belmopan and Belize City.

In addition to the recurrent budget, the MOH also has expenditures described as "capital". In fact much of what is spent under this category is not capital in the true sense. It is, rather, monies for projects funded by foreign donors together with MOH counterpart funds, some of which is clearly recurrent in nature. The Annual Estimates books do not have complete records in the capital category and, unlike the recurrent budget, do not show actual expenditures. For FY 1990/91 we obtained from the MOH Finance Officer the records from the vote control book for capital expenditures, although we were warned that these were also probably incomplete.

Apart from hospital data, very little financial information is routinely gathered and presented by district. The non-hospital data which is available by district is only available in disaggregated form in the district and cannot be obtained from centrally kept records. Personnel emoluments paid to staff and contract labor working in the district (doctors, nurses, vector control and environmental sanitation personnel and dentists) are the only non-hospital financial data available in the districts. Only the payment mechanism, not the decision-making power over staff, is decentralized.

To obtain breakdowns by district for subsistence and travel allowances, materials and supplies and other operating expenses, it was necessary to go through the files of requisition forms (kept in Belize City),

identify the district making the request for each form and sum the values by district. This procedure was carried out for 2 of the key budgetary heads with significant district level costs (Community Health Services and Vector Control).

Drug estimates were obtained from two sources: the Central Medical Stores (CMS) and Maternal Child Health (MCH) program. Annual records of drug expenditures by districts or by facility were not available; however, Central Medical Stores recently introduced a database inventory system (INVEC) which reports information on facility level drug requests and cost of each dispatch. Using requisitions for 81 days (July 15 - October 4) we projected costs for the entire fiscal year, and assumed that FY 1990-91 expenditures would be the same. The difference between the projected figure and the actual FY 1990-91 figures was assigned to a separate "other" category.

Program level breakdowns were difficult to calculate. Some programs are vertical (eg vector control) but MCH activities involve more than one budgetary vote of the MOH (Community Health Services, Central Stores) plus a variety of donor contributions to MOH (EEC/UNICEF, PAHO, AID, Holland) and several nongovernment activities. Very few of these are clearly for one component of MCH (BFLA, BIB are two exceptions), the records of expenditure on materials and supplies is not by program area and there are no easy way to estimate the staff time allocation to different activities.

Comments on the methods

In Belize, the most problematic part of the data collection were:

- No summarized financial data by district (or health facility) available at districts or central administration (partly because finances are not decentralized).
- No expenditure data at all for drugs.
- Few data summarized by facility level, distinguishing hospital from health center resources use (this was particularly problematic for drugs and medical supplies which involve a very large number of different kinds of items).
- Within MCH planning, budgeting and expenditure is done by input type and not by program area.
- Difficulty of obtaining comparable programmatic data from donors.

ANNEX B

EXPENDITURE TABLES BY YEAR

EXPENDITURE OF THE BELIZE MINISTRY OF HEALTH & URBAN DEVELOPMENT BY YEAR
Expressed in $ Belize current prices ($1 Belize = $0.5 US)

	1986 (approved)			1987			1988			1989			1990	
General Administr	$	%	%Total	$	%	%Total	$	%	%Total	$	%	%Total	$	%
personnel	126000	75.9		171224	81.4		206644	73.7		192838	77.6		187681	63.0
travel & subst	11000	6.6		13185	6.3		15336	5.5		17747	7.1		20228	6.8
materials & sup	4000	2.4		3590	1.7		6291	2.2		5389	2.2		6056	2.0
other operating	20000	12.0		22475	10.7		31292	11.2		28652	11.5		23714	8.0
utilities	5000	3.0		0	0.0		20024	7.1		134	0.1		58919	19.8
equipment	0	0.0		0	0.0		650	0.2		2231	0.9		1450	0.5
rent	0	0.0		0	0.0		0	0.0		1500	0.6		0	0.0
TOTAL	166000	100.0	1.6	210474	100.0	1.7	280237	100.0	2.1	248491	100.0	1.8	298048	100.0
Director of Health Services														
personnel	506000	31.9		593423	32.8		502259	36.8		562617	48.1		501484	55.4
travel & subst	85000	5.4		98181	5.4		90163	6.6		72672	6.2		63377	7.0
materials & sup	15000	0.9		14079	0.8		20893	1.5		57705	4.9		12982	1.4
other operating	385000	24.3		487069	26.9		332102	24.4		375958	32.1		300539	33.2
utilities	520000	32.8		576173	31.8		332076	24.4		10476	0.9		11484	1.3
equipment	75000	4.7		41386	2.3		42865	3.1		46605	4.0		2734	0.3
rent		0.0		0	0.0		43050	3.2		43970	3.8		11858	1.3
TOTAL	1586000	100.0	15.6	1810311	100.0	14.6	1363408	100.0	10.3	1170003	100.0	8.3	904458	100.0
Community Health Services														
personnel	472000	100.0		574217	92.2		645018	89.1		728145	86.4		655247	84.7
travel & subst		0.0		15529	2.5		31338	4.3		28896	3.4		38676	5.0
materials & supplies		0.0		8973	1.4		15071	2.1		33159	3.9		29169	3.8
other operating		0.0		24305	3.9		32679	4.5		6149	0.7		41082	5.3
utilities		0.0		0	0.0		0	0.0		46605	5.5		9133	1.2
equipment		0.0		0	0.0		0	0.0						0.0
rent		0.0		0	0.0		0	0.0						0.0
TOTAL	472000	100.0	4.6	623024	100.0	5.0	724106	100.0	5.5	842954	100.0	5.9	773307	100.0
Dental Health Programme														
personnel	310000	100.0		349582	100.0		370025	79.6		385073	74.3		424525	76.3
travel & subst		0.0		0	0.0		5824	1.3		6892	1.3		6684	1.2
materials & supplies		0.0		0	0.0		86041	18.5		87050	16.8		98269	17.7
other operating		0.0		0	0.0		3165	0.7		37076	7.2		22800	4.1
utilities		0.0		0	0.0		0	0.0		1995	0.4		3798	0.7
equipment		0.0		0	0.0		0	0.0						0.0
rent		0.0		0	0.0		0	0.0						
TOTAL	310000	100.0	3.0	349582	100.0	2.8	465055	100.0	3.5	518086	100.0	3.7	556076	100.0
Dental Health														
personnel	111000	100.0		148206	100.0		143693	95.3		187626	94.8		174843	94.0
travel & subst		0.0		0	0.0		5371	3.6		7640	3.9		6300	3.4
materials & supplies		0.0		0	0.0		1153	0.8		1487	0.8		1979	1.1
other operating		0.0		0	0.0		591	0.4		1148	0.6		2856	1.5
utilities		0.0		0	0.0		0	0.0			0.0			0.0
equipment		0.0		0	0.0		0	0.0			0.0			0.
rent		0.0		0	0.0		0	0.0			0.0			0.
TOTAL	111000	100.0	1.1	148206	100.0	1.2	150808	100.0	1.1	197901	100.0	1.4	185978	100.

	1986 (approved)			1987			1988			1989			1990	
	$	%	%Total	$	%	%Total	$	%	%Total	$	%	%Total	$	%
School of Nursing														
personnel	208000	100.0		396714	100.0		388545	91.8		449141	92.0		429528	90.7
travel & subst		0.0		0	0.0		225	0.1		425	0.1		57	0.0
materials & supplies		0.0		0	0.0		32364	7.6		31685	6.5		40061	8.5
other operating		0.0		0	0.0		2228	0.5		4875	1.0		3925	0.8
utilities		0.0		0	0.0		0	0.0		1816	0.4			0.0
equipment		0.0		0	0.0		0	0.0			0.0			0.0
rent		0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	208000	100.0	2.0	396714	100.0	3.2	423362	100.0	3.2	487942	100.0	3.4	473571	100.0
Belize City Hospital														
personnel	2314000	86.1		3159600	87.6		3459794	88.7		3542052	90.3		3770861	91.0
travel & subst	0	0.0		0	0.0		0	0.0		0	0.0		0	0.0
materials & sup	375000	13.9		448834	12.4		388162	10.0		348891	8.9		336861	8.1
other operating		0.0		0	0.0		51655	1.3		30049	0.8		34800	0.8
utilities		0.0		0	0.0		0	0.0			0.0			0.0
equipment		0.0		0	0.0		0	0.0			0.0			0.0
rent		0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	2689000	100.0	26.5	3608434	100.0	29.2	3899611	100.0	29.5	3920992	100.0	27.7	4142522	100.0
Belmopan Hospital														
personnel	277000	83.2		311169	85.3		404127	86.8		450400	88.6		456218	86.0
travel & subst	0	0.0		0	0.0		3892	0.8		2800	0.6		4314	0.8
materials & sup	6000	1.8		5116	1.4		51013	11.0		44745	8.8		49015	9.2
other operating	50000	15.0		48509	13.3		4833	1.0		8784	1.7		18966	3.6
utilities		0.0		0	0.0		1500	0.3		1484	0.3		1837	0.3
equipment		0.0		0	0.0		0	0.0			0.0			0.0
rent		0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	333000	100.0	3.3	364794	100.0	2.9	465365	100.0	3.5	508213	100.0	3.6	530350	100.0
Orange Walk Hospital														
personnel	192000	76.5		306024	85.0		336378	84.8		366703	83.2		363288	84.4
travel & subst	0	0.0		0	0.0		3895	1.0		4121	0.9		3670	0.9
materials & sup	4000	1.6		3160	0.9		51416	13.0		55080	12.5		46158	10.7
other operating	55000	21.9		50731	14.1		5016	1.3		13573	3.1		16407	3.8
utilities	0	0.0		0	0.0		0	0.0		1379	0.3		824	0.2
equipment	0	0.0		0	0.0		0	0.0			0.0			0.0
rent	0	0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	251000	100.0	2.5	359915	100.0	2.9	396705	100.0	3.0	440856	100.0	3.1	430347	100.0
Corozal Hospital														
personnel	207000	86.3		272034	88.9		283358	89.0		308252	84.5		345818	84.9
travel & subst	0	0.0		0	0.0		3315	1.0		4934	1.4		7130	1.8
materials & sup	5000	2.1		4793	1.6		27238	8.6		38456	10.5		34994	8.6
other operating	28000	11.7		29167	9.5		4518	1.4		12047	3.3		18241	4.5
utilities	0	0.0		0	0.0		0	0.0		1236	0.3		1067	0.3
equipment	0	0.0		0	0.0		0	0.0			0.0			0.0
rent	0	0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	240000	100.0	2.4	305994	100.0	2.5	318429	100.0	2.4	364925	100.0	2.6	407250	100.0

an Ignacio Hospital														
personnel	191000	87.2		266615	89.2		306386	88.6		308060	85.4		316741	86.8
travel & subst	0	0.0		0	0.0		3729	1.1		5824	1.6		4226	1.2
materials & sup	3000	1.4		2526	0.8		30777	8.9		33312	9.2		30366	8.3
other operating	25000	11.4		29710	9.9		4827	1.4		12219	3.4		12240	3.4
utilities	0	0.0		0	0.0		0	0.0		1439	0.4		1165	0.3
equipment	0	0.0		0	0.0		0	0.0			0.0			0.0
rent	0	0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	219000	100.0	2.2	298851	100.0	2.4	345719	100.0	2.6	360854	100.0	2.5	364738	100.0
ıngriga Hospital														
personnel	192000	79.0		242253	83.6		276530	84.8		325046	84.7		405422	85.9
travel & subst	0	0.0		0	0.0		4342	1.3		5900	1.5		6414	1.4
materials & sup	1000	0.4		2532	0.9		39551	12.1		40365	10.5		41831	8.9
other operating	50000	20.6		44862	15.5		5570	1.7		11419	3.0		17125	3.6
utilities	0	0.0		0	0.0		0	0.0		1136	0.3		1110	0.2
equipment	0	0.0		0	0.0		0	0.0			0.0			0.0
rent	0	0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	243000	100.0	2.4	289647	100.0	2.3	325993	100.0	2.5	383866	100.0	2.7	471902	100.0
ıta Gorda Hospital														
personnel	182000	77.8		251713	84.6		293653	86.9		298708	85.8		291594	80.5
travel & subst	0	0.0		0	0.0		4361	1.3		3243	0.9		5662	1.6
materials & sup	7000	3.0		6287	2.1		34189	10.1		36832	10.6		42737	11.8
other operating	45000	19.2		39537	13.3		5701	1.7		7312	2.1		20236	5.6
utilities	0	0.0		0	0.0		0	0.0		1902	0.5		1867	0.5
equipment	0	0.0		0	0.0		0	0.0			0.0			0.0
rent	0	0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	234000	100.0	2.3	297537	100.0	2.4	337904	100.0	2.6	347997	100.0	2.5	362096	100.0
irmary										(not included)				
personnel	73000	100.0		93081	100.0		95235	70.3					106380	69.4
ravel & subst		0.0		0	0.0		38811	28.7					0	0.0
aterials & supplies		0.0		0	0.0		1377	1.0		0			40330	26.3
other operating		0.0		0	0.0		0	0.0					6593	4.3
tilities		0.0		0	0.0		0	0.0						0.0
quipment		0.0		0	0.0		0	0.0						0.0
rent		0.0		0	0.0		0	0.0						0.0
TOTAL	73000	100.0	0.7	93081	100.0	0.8	135423	100.0	1.0			0.0	153303	100.0
ıtral Stores														
personnel	60000	3.1		67248	3.0		66212	2.6		68450	2.1		58521	2.0
avel & subst	0	0.0		0	0.0		1282	0.1		1957	0.1		783	0.0
terials & sup	1300000	66.3		1605950	71.2		2415731	96.4		3200283	96.4		2876552	96.9
other operating	600000	30.6		583830	25.9		22522	0.9		50183	1.5		33664	1.1
ilities	0	0.0		0	0.0		0	0.0			0.0			0.0
uipment	0	0.0		0	0.0		0	0.0			0.0			0.0
rent	0	0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	1960000	100.0	19.3	2257028	100.0	18.2	2505747	100.0	19.0	3320873	100.0	23.4	2969520	100.0

Communicable Diseases														
personnel	36000	100.0		21622	100.0		47515	94.9		58190	95.6		58075	93.0
travel & subst		0.0		0	0.0		689	1.4		0	0.0		1682	2.7
materials & supplies		0.0		0	0.0		1186	2.4		2280	3.7		2200	3.5
other operating		0.0		0	0.0		688	1.4		388	0.6		460	0.7
utilities		0.0		0	0.0		0	0.0			0.0			0.0
equipment		0.0		0	0.0		0	0.0			0.0			0.0
rent		0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	36000	100.0	0.4	21622	100.0	0.2	50078	114.1	0.4	60858	100.0	0.4	62417	100.0
Epidem. Surveillance														
personnel	32000	100.0		14101	100.0		41060	93.6		40276	90.4		46937	91.1
travel & subst		0.0		0	0.0		70	0.2		421	0.9		319	0.6
materials & supplies		0.0		0	0.0		1645	3.7		3099	7.0		3467	6.7
other operating		0.0		0	0.0		1110	2.5		754	1.7		798	1.5
utilities		0.0		0	0.0		0	0.0			0.0			0.0
equipment		0.0		0	0.0		0	0.0			0.0			0.0
rent		0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	32000	100.0	0.3	14101	100.0	0.1	43885	100.0	0.3	44550	100.0	0.3	51521	100.0
Environmental Health														
personnel	195000	52.4		223988	72.0		251453	73.8		294023	82.2		253497	78.3
travel & subst	42000	11.3		14398	4.6		10026	2.9		9835	2.7		14461	4.5
materials & sup	15000	4.0		13500	4.3		7865	2.3		35900	10.0		32952	10.2
other operating	120000	32.3		59395	19.1		71212	20.9		17991	5.0		22683	7.0
utilities		0.0		0	0.0		0	0.0			0.0			0.0
equipment		0.0		0	0.0		0	0.0			0.0			0.0
rent		0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	372000	100.0	3.7	311281	100.0	2.5	340556	100.0	2.6	357749	100.0	2.5	323593	100.0
/ector Control														
personnel	253000	42.5		281487	49.6		313317	52.9		280844	54.2		490776	72.4
travel & subst	100000	16.8		97319	17.1		121768	20.6		108990	21.0		71124	10.5
materials & sup	170000	28.6		114284	20.1		113056	19.1		90670	17.5		85670	12.6
other operating	69600	11.7		71988	12.7		41736	7.0		35145	6.8		30557	4.5
utilities		0.0		0	0.0		0	0.0		0	0.0			0.0
equipment		0.0		0	0.0		2200	0.4		2400	0.5			0.0
rent	2400	0.4		2400	0.4		0	0.0		0	0.0			0.0
TOTAL	595000	100.0	5.9	567478	100.0	4.6	592077	100.0	4.5	518049	100.0	3.7	678127	100.0
ealth Education														
personnel	35000	100.0		37011	82.9		42350	77.3		52547	64.4		64877	82.4
travel & subst		0.0		0	0.0		1768	3.2		2145	2.6		2811	3.6
materials & supplies		0.0		5038	11.3		5973	10.9		21399	26.2		5845	7.4
other operating		0.0		2573	5.8		4722	8.6		5551	6.8		5198	6.6
utilities		0.0		0	0.0		0	0.0		0	0.0			0.0
equipment		0.0		0	0.0		0	0.0			0.0			0.0
rent		0.0		0	0.0		0	0.0			0.0			0.0
TOTAL	35000	100.0	0.3	44622	100.0	0.4	54813	100.0	0.4	81642	100.0	0.6	78731	100.0

ANNEX C

EXPENDITURE TABLES BY DISTRICT AND PROGRAM

DISTRIBUTION OF MOH EXPENDITURE FY 1990/1991 ($ Belize 1990)
By district, programme and input type

	District							Total
	Belize	Corozal	Orange	Ignacio	Belmopan	Dangriga	P.Gorda	Country
General administration								
Personnel	187,681	0	0	0	0	0	0	187,681
Travel & subs.	20,228	0	0	0	0	0	0	20,228
Materials & supplies	6,056	0	0	0	0	0	0	6,056
Other Operating	23,714	0	0	0	0	0	0	23,714
Utilities	58,919	0	0	0	0	0	0	58,919
Equipment	1,450	0	0	0	0	0	0	1,450
Rent	0	0	0	0	0	0	0	0
Sub-total	298,048	0	0	0	0	0	0	298,048
Dir Health Services								
Personnel	501,484	0	0	0	0	0	0	501,484
Travel & subs.	63,377	0	0	0	0	0	0	63,377
Materials & supplies	12,982	0	0	0	0	0	0	12,982
Other Operating	300,539	0	0	0	0	0	0	300,539
Utilities	11,484	0	0	0	0	0	0	11,484
Equipment	2,734	0	0	0	0	0	0	2,734
Rent	11,858	0	0	0	0	0	0	11,858
Reparation **	55,507	55,507	55,507	55,507	55,507	55,507	55,507	388,546
Sub-total	959,965	55,507	55,507	55,507	55,507	55,507	55,507	1,293,004
Community Hlth Serv.								
Personnel	252,368	80,716	91,753	73,212	24,117	52,067	81,014	655,247
Travel & subs.	7,427	6,288	4,814	3,826	250	5,968	10,103	38,676
Materials & supplies	10,923	1,185	2,147	413	563	2,098	918	18,247
Other Operating	14,453	5,203	4,587	5,448	1,967	5,593	3,831	41,082
Utilities	2,137	471	1,367	272	0	3,171	1,715	9,133
Equipment	0	0	0	0	0	0	0	0
Rent	0	0	0	0	0	0	0	0
Sub-total	287,308	93,863	104,668	83,171	26,897	68,897	97,581	762,384
Mental Health								
Personnel	424,525	0	0	0	0	0	0	424,525
Travel & subs.	6,684	0	0	0	0	0	0	6,684
Materials & supplies	98,269	0	0	0	0	0	0	98,269
Other Operating	22,800	0	0	0	0	0	0	22,800
Utilities	3,798	0	0	0	0	0	0	3,798
Equipment	0	0	0	0	0	0	0	0
Rent	0	0	0	0	0	0	0	0
Sub-total	556,076	0	0	0	0	0	0	556,076

	Belize	Corozal	Orange	Ignacio	Belmopan	Dangriga	P. Gorda	Country
Vector Control								
Personnel	171,451	68,973	63,880	71,846	0	44,831	69,794	490,776
Travel & subs.	20,728	14,505	5,710	15,934	0	2,783	11,464	71,124
Materials & supplies	84,998	406	0	150	0	60	56	85,670
Other Operating	26,802	2,742	190	694	0	102	27	30,557
Utilities	0	0	0	0	0	0	0	0
Equipment **	94,750	94,750	94,750	94,750	94,750	94,750	94,750	663,247
Rent	0	0	0	0	0	0	0	0
Sub-total	398,729	181,376	164,530	183,374	94,750	142,526	176,091	1,341,374
Health Education								
Personnel	64,877	0	0	0	0	0	0	64,877
Travel & subs.	2,811	0	0	0	0	0	0	2,811
Materials & supplies	5,845	0	0	0	0	0	0	5,845
Other Operating	5,198	0	0	0	0	0	0	5,198
Utilities	0	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0	0
Rent	0	0	0	0	0	0	0	0
Sub-total	78,731	0	0	0	0	0	0	78,731
Primary Health Care								
Personnel	4,786	4,786	4,786	4,786	4,786	4,786	4,786	33,504
Travel & subs.	0	0	0	0	0	0	0	0
Materials & supplies	0	0	0	0	0	0	0	0
Other (CARE)	3,571	3,571	3,571	3,571	3,571	3,571	3,571	25,000
Utilities	0	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0	0
Rent	0	0	0	0	0	0	0	0
Sub-total	8,358	8,358	8,358	8,358	8,358	8,358	8,358	58,504
School of Nursing								Total
Personnel	429,528							429,528
Travel & subs.	57							57
Materials & supplies	40,061							40,061
Other Operating	3,925							3,925
Utilities	1,816							1,816
Equipment	0							0
Rent	0							0
Sub-total	475,387	0	0	0	0	0	0	475,387

	Belize	Corozal	Orange	Ignacio	Belmopan	Dangriga	P. Gorda	Country
Dental Health								
Personnel	48,494	39,694	26,330	5,558	27,195	27,673		174,945
Travel & subs.	6,300	0	0	0	0	0	0	6,300
Materials & supplies	1,979	0	0	0	0	0	0	1,979
Other Operating	2,856	0	0	0	0	0	0	2,856
Utilities	0	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0	0
Sub-total	59,629	39,694	26,330	5,558	27,195	27,673	0	186,080
Communicable Disease								
Personnel	58,075	0	0	0	0	0	0	58,075
Travel & subs.	1,682	0	0	0	0	0	0	1,682
Materials & supplies	2,200	0	0	0	0	0	0	2,200
Other Operating	460	0	0	0	0	0	0	460
Utilities	0	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0	0
Rent	0	0	0	0	0	0	0	0
Sub-total	62,417	0	0	0	0	0	0	62,417
Epide. Surveillance								
Personnel	46,937	0	0	0	0	0	0	46,937
Travel & subs.	319	0	0	0	0	0	0	319
Materials & supplies	3,467	0	0	0	0	0	0	3,467
Other Operating	798	0	0	0	0	0	0	798
Utilities	0	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0	0
Rent	0	0	0	0	0	0	0	0
Sub-total	51,521	0	0	0	0	0	0	51,521
Environmental Health								
Personnel	168,752	14,760	10,712	16,141	0	8,743	9,358	228,466
Travel & subs.	14,461	0	0	0	0	0	0	14,461
Materials & supplies	32,952	0	0	0	0	0	0	32,952
Other Operating	22,683	0	0	0	0	0	0	22,683
Utilities	0	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0	0
Rent	0	0	0	0	0	0	0	0
Sub-total	238,848	14,760	10,712	16,141	0	8,743	9,358	298,562

	Belize	Corozal	Orange	Ignacio	Belmopan	Dangriga	P. Gorda	Country
Belize City Hospital								
Personnel	3,770,861							3,770,861
Travel & subs.	0							336,861
Materials & supplies	336,861							371,661
Other Operating	34,800							34,800
Utilities	0							0
Equipment	0							0
Rent	0							0
Sub-total	4,142,522	0	0	0	0	0	0	4,514,183
Belmopan Hospital								
Personnel					456,218			456,218
Travel & subs.					4,314			4,314
Materials & supplies					49,015			49,015
Other Operating					18,966			18,966
Utilities					1,837			1,837
Equipment					0			0
Rent					0			0
Sub-total	0	0	0	0	530,350	0	0	530,350
Orange Walk Hospital								
Personnel			363,288					363,288
Travel & subs.			3,670					3,670
Materials & supplies			46,158					46,158
Other Operating			16,407					16,407
Utilities			824					824
Equipment			0					0
Rent			0					0
Sub-total	0	0	430,347	0	0	0	0	430,347
Corozal Hospital								
Personnel		345,818						345,818
Travel & subs.		7,130						7,130
Materials & supplies		34,994						34,994
Other Operating		18,241						18,241
Utilities		1,067						1,067
Equipment		0						0
Rent		0						0
Sub-total	0	407,250	0	0	0	0	0	407,250

	Belize	Corozal	Orange	Ignacio	Belmopan	Dangriga	P. Gorda	Countr
San Ignacio Hospital								
Personnel				316,741				316,74
Travel & subs.				4,226				4,22
Materials & supplies				30,366				30,36
Other Operating				12,240				12,24
Utilities				1,165				1,165
Equipment				0				0
Rent				0				0
Sub-total				364,738				364,738
Dangriga Hospital								
Personnel						405,422		405,422
Travel & subs.						6,414		6,414
Materials & supplies						41,831		41,831
Other Operating						17,125		17,125
Utilities						1,110		1,110
Equipment								0
Rent								0
Sub-total						471,902	0	471,902
Punta Gorda Hospital								
Personnel							291,594	291,594
Travel & subs.							5,662	5,662
Materials & supplies							42,737	42,737
Other Operating							20,236	20,236
Utilities							1,867	1,867
Equipment							0	0
Rent							0	0
Sub-total							362,096	362,096
Infirmary								
Personnel	106,380							106,380
Travel & subs.	0							0
Materials & supplies	40,330							40,330
Other Operating	6,593							6,593
Utilities	0							0
Equipment	0							0
Rent	0							0
Sub-total	153,303							153,303
Central Stores								
Personnel	58,521							58,521
Travel & subs.	783							783
Drugs & Medical Suppl	2,876,552							2,876,552
Other Operating	33,664							33,664
Utilities	0							0
Equipment	0							0
Rent	0							0
Sub-total	2,969,520							2,969,520

ANNEX D

UTILIZATION STATISTICS

UTILIZATION OF PRIMARY HEALTH CARE FACILITIES

Source: 1990 Medical Statistics Report [MOH Belize]

Districts--->	Belize	Corozal	Orange Walk	Cayo	Dangriga	Toledo	Coun Tota
Total Visits	26,167	16,492	15,808	20,522	13,726	15,266	107,
Total Maternal Visits	8,855	4,431	4,967	5,783	4,056	2,759	30,
Pre-Natal Visits	8,417	4,317	4,937	5,630	3,561	2,759	29,
received CS counseling	497	157	252	28	49	70	1,
Post-Natal Visits	438	114	30	153	495	0	1,
received CS counseling	240	101	33	56	10	0	4
referred to fam. planning	155	21	0	2	18	0	1
Total Child Visits	17,312	12,061	10,841	14,739	9,670	12,507	77,
health center visits	14,628	5,131	6,813	8,720	6,463	4,493	46,
mobile clinic visits	2,684	6,930	4,028	6,019	3,207	8,014	30,
Cases of diarrhea	269	179	189	256	264	605	1,
treated w/ ORS	126	137	162	247	291	605	1,
Cases of ARI	823	763	1,171	673	1,184	1,204	5,
Mild	752	728	849	615	1,131	1,048	5,
Moderate	69	35	258	53	50	156	62
Severe	2	0	64	5	3	0	7
ARI cases treated w/ ATB	16	37	260	25	160	14	51
Children's Immunizations							
BCG (total)	1,738	1,009	1,106	1,471	702	687	6,
health center	1,599	466	766	869	476	261	4,
mobile clinic	139	543	340	602	226	426	2,
1st dose DPT (total)	1,878	1,073	1,298	1,462	835	1,012	7,55
health center	1,660	517	869	937	570	545	5,09
mobile clinic	218	556	429	525	265	467	2,46
2nd dose DPT (total)	1,786	1,093	1,370	1,366	802	1,030	7,447
health center	1,536	496	912	844	548	596	4,932
mobile clinic	250	597	458	522	254	434	2,515
3rd dose DPT (total)	1,802	1,123	1,296	1,369	735	978	7,303
health center	1,545	503	842	880	505	525	4,300
mobile clinic	257	620	454	489	230	453	2,503
booster DPT (total)	611	535	648	699	359	669	3,52
health center	474	247	371	314	227	434	2,067
mobile clinic	137	288	277	385	132	235	1,45

1st dose Polio (total)	1,950	1,069	1,250	1,373	856	840	7,338
health center	1,706	524	842	886	598	395	4,951
mobile clinic	244	545	408	487	258	445	2,387
2nd dose Polio (total)	1,834	1,096	1,296	1,286	867	882	7,261
health center	1,583	509	868	809	614	460	4,843
mobile clinic	251	587	428	477	253	422	2,418
3rd dose Polio (total)	1,695	1,126	1,237	1,357	792	839	7,046
health center	1,437	503	817	798	525	415	4,495
mobile clinic	258	623	420	559	267	424	2,551
booster Polio (total)	603	447	584	759	455	632	3,480
health center	493	251	341	324	315	436	2,160
mobile clinic	110	196	243	435	140	196	1,320
1st dose Measles (total)	1,919	831	1,266	1,424	818	935	7,193
health center	1,614	395	847	827	550	486	4,719
mobile clinic	305	436	419	597	268	449	2,474
booster Measles (total)	1,056	903	1,013	1,965	681	1,005	6,623
health center	888	412	627	991	462	393	3,773
mobile clinic	168	491	386	974	219	612	2,850
Pre-Natal Immunizations							
1st dose tetanus toxoid	389	256	211	284	202	122	1,464
2nd dose tetanus toxoid	394	210	190	213	165	64	1,236
booster tetanus toxoid	441	239	457	259	207	172	1,775

Notes:

1. Does not include cases seen and treated by community health workers.

ANNEX E

TOTAL EXPENDITURES BY DISTRICT

MOH RECURRENT EXPENDITURE BY DISTRICT
FY 1990-1991 Current Prices

TOTAL	Belize	Corozal	Orange	Ignacio	Belmopan	Dangriga	P.Gorda	TOT. COUNTR
Personnel	6,294,720	554,747	560,749	488,285	512,316	543,523	456,546	9,410,88
Travel & subs.	144,857	27,923	14,194	23,986	4,564	15,165	27,229	594,77
Materials & supplies	3,553,475	36,585	48,305	30,929	49,578	43,989	43,711	3,841,37
Other Operating	502,856	29,757	24,756	21,953	24,504	26,392	27,666	657,88
Utilities	78,154	1,538	2,191	1,437	1,837	4,281	3,582	93,02
Equipment	98,934	94,750	94,750	94,750	94,750	94,750	94,750	667,43
Rent	71,487	39,694	26,330	5,558	27,195	27,673	0	197,93
GRAND TOTAL	10,744,483	784,994	771,274	666,898	714,744	755,772	653,484	15,463,31
% per District	69%	5%	5%	4%	5%	5%	4%	10

** Including Capital 2

DISTRIBUTION OF MOH PRIMARY HEALTH CARE EXPENDITURE FY 1990/1991 ($ Belize 1990)
By district, and programme

	District								
	Belize	Corozal	Orange	Ignacio	Belmopan	Dangriga	P.Gorda	Total Country	Percent
General administration*	89,414	0	0	0	0	0	0	89,414	2%
Dir Health Services*	287,989	16,652	16,652	16,652	16,652	16,652	16,652	387,901	9%
Community Hlth Serv.	287,308	93,863	104,668	83,171	26,897	68,897	97,581	762,384	18%
Mental Health	556,076	0	0	0	0	0	0	556,076	13%
Dental Health	59,629	39,694	26,330	5,558	27,195	27,673	0	186,080	4%
Communicable Disease	62,417	0	0	0	0	0	0	62,417	1%
Epide. Surveillance	51,521	0	0	0	0	0	0	51,521	1%
Environmental Health	238,848	14,760	10,712	16,141	0	8,743	9,358	298,562	7%
Vector Control	398,729	181,376	164,530	183,374	94,750	142,526	176,091	1,341,374	31%
Health Education	78,731	0	0	0	0	0	0	78,731	2%
Primary Health Care	8,358	8,358	8,358	8,358	8,358	8,358	8,358	58,504	1%
Drugs***	302,751	25,170	27,216	17,746	15,700	22,535	24,049	435,167	10%
TOTAL	2,421,771	379,872	358,465	331,000	189,551	295,383	332,088	4,308,131	100%

* 30 percent of MOH expenditures

** 50 percent of MOH, other 50% is included vaccines

MOH Drugs Expenditure Estimation by District
Fiscal Year 1990-1991 (Current Belizian Thousands)

	Belize	Corozal	Orange	Sn Ignc	Belmopan	Dngrga	P.Gorda	COUNTRY TOTAL	%
Primary Health Care									
Mental	206,794	0	0	0	0	0	0	206,794	
Dental	4,635	967	0	0	114	0	0	5,716	
TB	713	713	713	713	713	713	713	4,993	
Traditional Birth	1,608	1,608	1,608	1,608	1,608	1,608	1,608	11,254	
Education	10	0	0	0	0	0	0	10	
Rural Health Cent	12,972	4,526	3,206	2,774	2,126	4,767	4,665	35,035	
Urban Health Cent	58,104	10,560	7,480	6,473	4,961	11,122	10,885	109,586	
Sub-total	284,836	18,375	13,007	11,568	9,522	18,210	17,871	373,389	
Vaccines	17,916	6,796	14,209	6,178	6,178	4,325	6,178	61,779	
PHC Sub-total	302,751	25,170	27,216	17,746	15,700	22,535	24,049	435,167	14%
	70%	6%	6%	4%	4%	5%	6%	100%	
Secondary Health Care									
Hospital	641,773	135,778	106,861	83,222	63,778	143,003	139,949	1,314,364	
Other Inpatient	348,116	25,906	25,906	25,906	25.906	25,906	25,906	503,551	
SC Sub-total	989,889	161,684	132,767	109,128	89,684	168,909	165,855	1,817,915	60%
	54%	9%	7%	6%	5%	9%	9%	100%	
Total	1,292,640	186,854	159,983	126,874	105,384	191,444	189,903	2,253,082	
Other*	423,754	69,214	56,835	46,716	38,392	72,307	70,999	778,217	26%
GRAND TOTAL	1,716,394	256,068	216,818	173,589	143,776	263,750	260,903	3,031,299	100%
	57%	8%	7%	6%	5%	9%	9%	100%	

* Difference between estimated and actual expenditure for FY 1990-1991

ANNEX F

GRAND TOTAL BUDGETARY BREAKDOWNS

Table 1. MOH GRAND TOTAL RECURRENT EXPENDITURE BY YEAR
Expressed in $ Belize current prices ($1 Belize = $0.5 US)

Input	1986 (approved)			1987			1988			1989			1990		
	$	%	%Total	$	%	%Total	$	%	%Total	$	%	%Total	$	%	%
ersonnel	5,972,000	58.8		7,781,312	62.9		8,473,552	64.1		8,898,991	62.8		9,402,313	66.1	
travel & subst	238,000	2.3		238,612	1.9		346,205	2.6		284,442	2.0		257,918	1.8	
aterials & suppl	1,905,000	18.7		2,238,662	18.1		3,330,992	25.2		4,167,787	29.4		3,817,493	26.8	
her operating	1,447,600	14.2		1,494,151	12.1		626,167	4.7		659,273	4.7		632,885	4.5	
utilities	525,000	5.2		576,173	4.7		353,600	2.7		69,602	0.5		91,204	0.6	
uipment	75,000	0.7		41,386	0.3		45,715	0.3		51,236	0.4		4,184	0.0	
ot	2,400	0.0		2,400	0.0		43,050	0.3		45,470	0.3		11,858	0.1	
TOTAL	10,165,000	100.0	100.0	12,372,696	100.0	100.0	13,219,281	100.0	100.0	14,176,801	100.0	100.0	14,217,854	100.0	10

Table 1.3

BELIZE MOH EXPENDITURE BY BROAD PROGRAMME AREA (1986-1990)
Expressed in $ Belize current prices ($1 Belize = $0.5 US)

	1986		1987		1988		1989		1990	
	$		$	%	$	%	$	%	$	%
[illegible]tral Administration	1752000	17.2	2020785	16.3	1643645	12.4	1418494	10.0	1202506	8.5
[illegible]y Health Care	1963000	19.3	2079916	16.8	2421378	18.3	2621789	18.5	2709750	19.1
pitals	4209000	41.4	5525172	44.7	6089726	46.1	6327703	44.6	6709205	47.2
[illegible]	1960000	19.3	2257028	18.2	2505747	19.0	3320873	23.4	2969520	20.9
[illegible]	281000	2.8	489795	4.0	558785	4.2	487942	3.4	626874	4.4
[illegible]	10,165,000	100	12,372,696	100	13,219,281	100	14,176,801	100	14,217,854	100

Table 1.4

Capital Expenditures (Local Sources)

	1986	%	1987	%	1988	%	1989	%	1990	%
Hospital equipment	100000	4.4	120000	14.1	110000	19.3	126800	13.4	144401	19.0
Primary Health Care	30000	1.3	30000	3.5	50000	8.8	72347	7.6	51504	6.8
Repairs of med. buildi	0	0.0	100000	11.8	100000	17.5	150000	15.8	388546	51.2
Vector control	20000	0.9	600000	70.6	0	0.0	472662	49.9	118437	15.6
AIDS prevention	0	0.0	0	0.0	10000	1.8	100000	10.6	0	0.0
Maternal and Child Hea	0	0.0	0	0.0	50000	8.8	25000	2.6	0	0.0
Water System	130000	5.7	0	0.0	0	0.0	0	0.0	0	0.0
Community Development	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Better health	2000000	87.7	0	0.0	250000	43.9	0	0.0	0	0.0
Vehicle Purchase	0	0.0	0	0.0	0	0.0	0	0.0	55956	7.4
TOTAL	2,280,000	100	850,000	100	570,000	100	946,809	100	758,844	100

Table 1.5

Capital Expenditure Estimates (Overseas Economic Co-operation Programme Sources)

	1986	%	1987	%	1988	%	1989	%	1990	%
Belize City Hospital	300000	6.8	250000	6.2	500000	35.7	1750000	59.7	750000	39.2
MCH (CARE)	0	0.0	140000	3.5	300000	21.4	246641	8.4	456400	23.8
Vector control (USAID)	3000000	67.6	2379000	59.1	400000	28.6	572000	19.5	510000	26.6
Child Survival (UNICEF	0	0.0	500000	12.4	100000	7.1	250000	8.5	120000	6.3
Health Planning (PAHO/	0	0.0	0	0.0	100700	7.2	113000	3.9	78234	4.1
Village Water (CARE)	200000	4.5	453000	11.3	0	0.0	0	0.0	0	0.0
Water & San. (UNICEF)	500000	11.3	300000	7.5	0	0.0	0	0.0	0	0.0
Health Centre Renovati	439000	9.9	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL	4,439,000	100	4,022,000	100	1,400,700	100	2,931,641	100	1,914,634	100

ANNEX G

PERSONS CONTACTED

INDIVIDUALS CONTACTED

USAID

Ms. Amelia Cadle, US AID Health Programs Coordinator
Mr. Patrick Mc Duffie, US AID General Development Officer
Ms. Barbara P. Sandoval, US AID Representative

Ministry of Health

Dr. Theodore Aranda, Minister of Health & Urban Development

Dr. Fred Smith, Permanent Secretary MOH

Dr. Kurella Rao, Director Primary Health Care MOH

Dr. Ramon Figuerroa, Director Maternal Child Health MOH

Nurse Benguche, Public Health Nursing Supervisor, Matron Roberts Health Centre

Ms. Cathy Bottaro, Director Health Education & Community Participation Division)

Mr. Ernest Gledden, Acting Financial Officer MOH

Ms. Elaine Clark, Medical Statistics Officer

Ms. Noreen Kerr, Pharmacist, Supplies Officer

Ms. Deborah Godoy, Finance Clerk

Ms. Kurleen Wallford, Finance Clerk

Ms. Sonia Belisle, Chief Accountant

Mr. Kenneth Arthurs, Senior Dispenser Belize City Hospital

Mr. Felix Asemota, Chief Pharmacist Belize City Hospital

Mr. Matthew Valesquez, PhD, Director of Mental Health

Chris Bennett, Director of Dental Health

Dr. Castillo, District Health Officer for Belize

Mr. Alfredo Cruz, Administrative Assistant

Ms. Jacqueline Wagner, Second Class Clerk

Ms. Valeria Samuels, Assistant Permanent Secretary

NGOs

CARE

Mr. Larry Holzman, Country Director, CARE
Mr. Randolph Pitts, Associate Director, CARE
Mr. Rafael Cambranes, Financial Controller, CARE

UNICEF

Ms. Kathy Kasprisin, Assistant Representative

PAHO

Dr. Cardenas, M.D., Representative
Dr. L. Ninette Reneau, MD, MPH Assistant Representative

BFLA

Mr. Jose Vasquez, Financial Accountant

MSF

Dr. Mario Garcia MD, MSc. Project Coordinator

UNHCR

Christian Koch, Representative

DISTRICTS

Belmopan

Dr. Victoriano Valdez, opthalmologist

Dr. Jesus Ken, Surgeon, DMO

Ms. Beverly Lesley, Clerk

Ms. Michelle Meighan, Finance Clerk

Mr. Sydney Codd, Dispenser

Ms. Dorothy Bradley, Rural Health Nurse, Valley of Peace Health Centre

Ms. Clara Bustamante, PRODERE

San Ignacio

Ms. Ruth Galvez Gutierrez, Dispenser

Mr. Alexander Fraser, PHI, environmental preogramme

Mr. Roguel Rivero, Evaluator, Vector Vontrol

Corozal

Dr. Barbosa, DMO

Nurse Helen Rosada, RHN, Urban Health Centre

Ms. Leticia Ranchera, Clerk

Mr. Roger Duran, Dispenser

Toledo

Dr. B. Raju, Hospital Director

Elizabeth Belisle, Rural Health Nurse, Hospital Health Center

Aileen Archer, Microscopist, Malaria, Punta Gorda Hospital

Orlando Clan, Evaluator, Vector Control, Punta Gorda

Dave Brackett, First Class Clerk

Hazel Cayetano, Public Health Nurse

Pamela Genus, Pharmacist, Punta Gorda

Shawnela Kelly, Nurse, San Antonio Health Center

Dangriga

Vincent Bernadez, Assistant Pharmacist, Stand Greek Hospital

ANNEX H

SCOPE OF WORK

Title: Study of PHC/MCH recurrent costs in Belize

Contractor: University Research Corporation

Consultants: Margaret Phillips and Annette Bongiovanni (stage 1) and Tom Bossert and Veronica Vargas (stage 2)

Duration: July 29 - October 25

Objectives: The primary objectives of the study are to (i) identify recurrent costs of primary health care/child survival activities; (ii) identify additional inputs required to meet PHC/MCH targets; (iii) document the level of donor dependence in the health sector; and (iv) provide general recommendations on potential methods of financing recurrent costs.

Purpose: The purpose of the study is to provide essential information to decision-makers on the costs of current and planned PHC/MCH activities. This will be accomplished through an analysis of inputs made to these activities in the past and projections of future costs. The study is intended to serve as a basis for policy dialogue and planning with the Government of Belize and with donors.

General Parameters: The study will take a broad view of PHC/MCH to include activities conducted at urban health centers, rural centers and mobile clinics and by community health workers and district level public services such as vector control and environmental sanitation. Since social security and the private-for-profit sector play a relatively small role in health service provision, the focus will be on government services (including those supported by donors). In addition, special attention will be paid to the CHW programs for which donor funding is currently being phased out.

Tasks: The following major tasks will be undertaken:

1. Determine the levels of MOH recurrent costs over the period 1986-1990;

2. Determine the recurrent costs for a single year (1990) by types of inputs, program area and by district;

3. Determine MOH expenditures as a percentage of total government expenditure and of GDP;

4. Determine current financial dependence on donor programs and resources required to continue the programs as external assistance is phased out;

5. Determine inputs required to meet program targets;

6. Link expenditures to service productivity where feasible to explore efficiency and financing issues;